ST. LOUIS DISTRICT HISTORIC PROPERTIES MANAGEMENT REPORT NO. 48

PHASE III RECOVERY AT THE PERSIMMON SITE (11-C-152), SWAN LAKE HABITAT REHABILITATION ENHANCEMENT PROJECT (HREP), ENVIRONMENTAL MANAGEMENT PROGRAM (EMP), POOL 26, ILLINOIS RIVER, CALHOUN COUNTY, ILLINOIS

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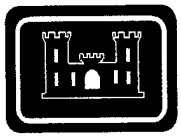
CONTRACT NUMBER DACW-43-93-D-0514, DELIVERY ORDER #20



US Army Corps of Engineers
St. Louis District

January 1996

Phase III Data Recovery at the Persimmon Site (11-C-152), Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois

Prepared for
U.S. Army Corps of Engineers
St. Louis District

Contract DACW43-93-D-0514
Delivery Order No. 20

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Cultural Resources Management
Report No. 268

January 1996

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	January, 1996	Final Report

4. TITLE AND SUBTITLE Phase III Recovery at the Persimmon Site (11-C-152), Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois

5. FUNDING NUMBERS
Contract No.
DACW43-93-D-0514

Delivery Order No. 20

6. AUTHOR(S)
Steven Titus, Wes Neal, Jeffrey D. Anderson and Gordon Howe

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
American Resources Group, Ltd.
127 N. Washington
Carbondale, Illinois 62901

8. PERFORMING ORGANIZATION REPORT NUMBER
Management Report
No. 268

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Corps of Engineers, St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
St. Louis District
Historic Properties
Management Report
No. 48

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This report describes the results of Phase III mitigation (geomorphological study and archaeological excavation) at the multicomponent pre-historic Woodland Persimmon archaeological site (11-C-152), located partially within the proposed Pump Station #3 construction corridor, Swan Lake Habitat Rehibilitation Enhancement Project (HREP). The Swan Lake HREP is located in Navigation Pool 26, Illinois River (mile 5.0 to 13.0 along the right [west] bank), Calhoun County, IL. Persimmon site was most intensively occupied by Early Woodland Black Sand cultural groups (Cypress and Schultz phases), followed by lesser Middle and Late Woodland occupations. Persimmon site represents numerous short term reoccupations on and subsequently buried by the accreting Illinois River levee. Cultural resources clearance for the pump station project is recommend. Fieldwork was conducted in April, 1995, by American Resources Group, Ltd, Carbondale, IL for the U.S. Army Corps of Engineers, St. Louis District on lands managed for waterfowl by the U.S. Fish and Wildlife Service. The HREP project is planned under the Environmental Management Program (EMP) established to enhance and rehabilitate the Upper Mississippi River system.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Archaeology, Cultured Resources, Illinois River, Early Woodland, Persimmon prehistoric site, Environmental Management Program	229
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRAC
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

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Block 10. Sponsoring/Monitoring Agency Report Number. *(If known)*

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ST. LOUIS DISTRICT HISTORIC PROPERTIES MANAGEMENT REPORT NO. 48
Phase III Recovery at the Persimmon Site (11-C-152)

Errata

Page	Line	Comment
v	25	Havan should read Havana.
5	23	Bretz 1961, should read Bretz **and Harris** 1961.
5	27	Schubert 1986, should read Schuberth 1986.
9	38	Add "**little**" before barley.
31	24	Change to read "The Persimmon site was identified **on the site form...**"
64	41	Cole and Duel 1930, should read 1937.
108	9	Koldehoff 1986, should read 1985.

MAKE THE FOLLOWING REFERENCE CHANGES (**bold**)

Conner, Michael D.
Delete 1985 reference given and add the following:
1985 Introduction. In Deer Track: A Lake Woodland Village in the Mississippi Valley, edited by Charles R. McGimsey and Michael D. Conner, pp. 1-5. Center for American Archeology, Kampsville, Illinois.

Morgan, David T.
Delete 1985 reference given and add the following:
1985 Ceramic Analysis. In Smiling Dan, Structure and Function at a Middle Woodland Settlement in the Illinois, edited by Barbara D. Stafford and Mark B. Sant, pp. 183-257. Kampsville Archeological Center, Center for American Archeology, Archeological Research Center, Kampsville, Illinois.

Morgan, David T.
Delete 1986 reference given and joint authors Asch and Stafford, add the following:
1986 Ceramics. In Woodland Period Occupations of the Napoleon Hollow Site in the Lower Illinois Valley, edited by Michael D. Wiant and Charles R. McGimsey, pp. 364-426. Kampsville Archeological Center Research Series, vol. 6. Center for American Archeology, Kampsville, Illinois.

Munson, Patrick J.
Delete 1986 reference given and add the following:
1986 Black Sand and Havana Tradition Ceramic Assemblages and Culture History in the Central Illinois River Valley. In Early Woodland Archeology, edited by Kenneth B. Farnsworth and Thomas E. Emerson, p. 280-300. Center for American Archeology Press, Kampsville, Illinois.

Struever, Stuart
1968**a** A Re-Examination of Hopewell in eastern North America. Unpublished Ph.D. **dissertation**. University of Chicago.

1986**b** Woodland Subsistence-Settlement Systems in the Lower Illinois Valley. In New Perspectives in Archaeology. edited by S. R. and L. R. Binford, pp. 285-312. Aldine, Chicago.

Worthen, A. H.
1868 **Geology and Paleontology.** Geological Survey of Illinois **III.** [Delete "Perry County."]

ADD TO "REFERENCES":

Asch, Nancy B. and David L. Asch
1986 Woodland Period Archeobotany of the Napoleon Hollow Site. In Woodland Period Occupations of the Napoleon Hollow Site in the Lower Illinois Valley, edited by Michael D. Wiant and Charles R. McGimsey, pp. 427-512. Kampsville Archeological Center Research Series, Vol. 6. Center for American Archeology, Kampsville, Illinois.

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1984 Early Woodland and Middle Woodland periods. In American Bottom Archaeology, edited by Charles J. Bareis and James W. Porter, pp. 59-103. University of Illinois Pres, Urbana and Chicago.

Illinois Archaeological Survey
1975 Persimmon site, site form. On file Illinois State Museum, Springfield, Illinois.

Schuberth, Christopher J.
1986 A View to the Past: An Introduction to Illinois Geology. Illinois State Museum, Springfield, Illinois.

ABSTRACT

This report presents the results of Phase III excavations at the Persimmon site (11-C-152), a multicomponent Woodland site partially contained within the construction corridor of the Swan Lake Habitat Rehabilitation Enhancement Project (HREP). The Swan Lake HREP project area is located in Navigation Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right [west] bank), Calhoun County, Illinois (Figure 1). This research was carried out by American Resources Group, Ltd., Carbondale, Illinois, for the U.S. Army Corps of Engineers, St. Louis District, under the terms of a subcontract (No. DACW43-93-D-0514) with Harland Bartholomew and Associates, Chesterfield, Missouri.

The current investigation indicates that Mississippi River gleyed deposits of fine sand and organic debris accumulated during the late Holocene around 4000 B.P. Near-channel Mississippi River overbank deposits accumulated at the site until about 3700 B.P. when stability and soil development occurred on the terrace. Illinois River Valley aggradation continued on the lower surfaces to about 3000 B.P. based on Hajic's (1987) work, and is followed by increased flooding and flood basin scour. The higher Mississippi River terrace appears to have stabilized after 3700 B.P. as recognized by soil profile development.

The Persimmon site represents a series of Woodland occupations dating to the Early Woodland, Middle Woodland, and Late Woodland periods. The site was most intensively occupied by Early Woodland Black Sand Cypress and Schultze phase groups. Despite moderately high artifact density and the presence of a relatively deep cultural deposit, feature density and artifact assemblage diversity are low, and storage facilities and structures are absent. This pattern suggests the site consists of numerous reoccupations, each of generally short duration. The presence, however, of a fairly large ceramic assemblage suggests the site may have been repeatedly occupied by small, highly mobile residential groups. This settlement pattern is characteristic of a foraging subsistence strategy.

The faunal and botanical assemblages contain little evidence of seasonality, although the presence of turtle and nuts may indicate summer and fall occupations. In any event, the Persimmon site was clearly a favored settlement location for Black Sand groups for perhaps hundreds of years, giving ready access to a range of resources associated with both woodland and aquatic environments.

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CHAPTER I. INTRODUCTION

Steve Titus and W. Gordon Howe

This report presents the results of Phase III excavations at the Persimmon site (11-C-152), a multicomponent Woodland site partially contained within the construction corridor of the Swan Lake Habitat Rehabilitation Enhancement Project (HREP). The Swan Lake HREP project area is located in Navigation Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right [west] bank), Calhoun County, Illinois (Figure 1). This research was carried out by American Resources Group, Ltd., Carbondale, Illinois, for the U.S. Army Corps of Engineers, St. Louis District, under the terms of a subcontract (No. DACW43-93-D-0514) with Harland Bartholomew and Associates, Chesterfield, Missouri.

The excavations at the Persimmon site were part of a larger cultural resources management project involving the identification and assessment of all cultural resources present within the Swan Lake HREP project area (Titus et al. 1995). The Swan Lake HREP is part of the Environmental Management Program established by PL-99-662 to enhance and rehabilitate the Upper Mississippi River system. Located on U.S. Army Corps of Engineers fee land, the Swan lake HREP includes the Fuller Lake State Fish and Waterfowl Management Area, which is managed by the Illinois Department of Conservation, and a portion of the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service. The purpose of the Swan Lake HREP is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in the three lake units of the Swan Lake complex. Accordingly, the St. Louis District is proposing to construct a riverside levee, three pump stations with channels and control structures, and a series of related facilities. Cultural resources located within the project area are potentially subject to impacts from activities associated with the construction of these water-level control facilities.

The Persimmon site was first recorded during an Illinois River shoreline survey conducted by the Contract Archaeology Program, Kampsville, Illinois, for the St. Louis District (Farnsworth 1976). During the Phase I archaeological and geomorphological survey of the Swan Lake HREP, the site was found to extend into the proposed construction area of Pump Station #3 and its associated channels (Titus et al. 1995). Although the portion of the Persimmon site located inside the project area seemed to have sustained a severe degree of erosional disturbance, the site appeared to contain an intact midden remnant associated with Early Woodland, and possibly Late Woodland, occupations. Consequently, the Persimmon site was evaluated as eligible for the National Register of Historic Places and additional investigation was recommended (Titus et al.

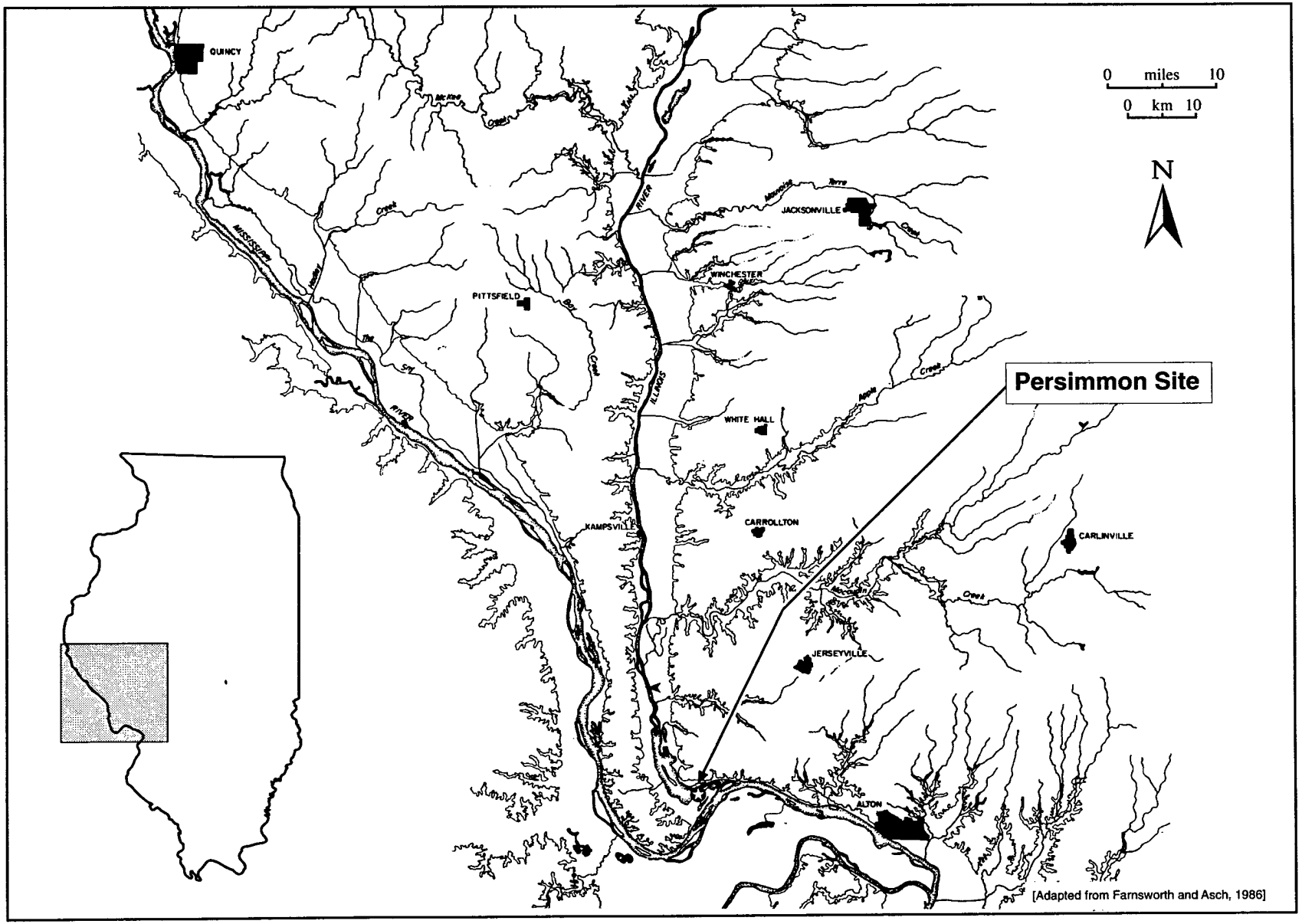


Figure 1. Location of the Persimmon site (11-C-152) within the lower Illinois River Valley.

1995:78). The Illinois Preservation Agency concurred with the recommendation that the anticipated adverse effects on the Persimmon site of the activities associated with the proposed construction of Pump Station #3 be mitigated through conducting a Phase III investigation of the portion of the site located inside the project area. Phase III archaeological and geomorphological investigations were conducted within the Pump Station #3 construction area April 10-28, 1995.

Site Location and Description

The Persimmon site is located on the right bank of the Illinois River, about five miles upstream from its confluence with the Mississippi River. The exact location of the site is the NE1/4, NW1/4 and the NW1/4, NE1/4 of Section 10, and the SW1/4, SE1/4 and the SE1/4, SE1/4 of Section 3, Township 13 South, Range 1 West, of the U.S. Geological Survey, Brussels, Illinois, 7.5' quadrangle map (Figure 2). The site occupies a natural levee along the northwestern margin of a terrace overlooking the Illinois River to the northwest, and Swan Lake to the west. Prior to the construction of Lock and Dam 26 in 1933, the Swan Lake flood basin consisted of an extensive marsh containing several small, backwater lakes and sloughs. At normal pool level (419 ft. AMSL), Swan Lake lies approximately 9 ft. below the highest point of the terrace occupied by the site.

The Persimmon site is defined by a continuous scatter of prehistoric artifacts occurring for a distance of approximately 825 m along the narrow, sandy beach bounding the Persimmon site on the north and west. A small portion of the southern end of the site is located within the proposed construction area of Pump Station #3 and its associated channels, but most of the site lies outside the project area to the north. The inland boundary of the portion of the site contained within the project area is located approximately 20 m east of the terrace edge, in a wooded area bounding the western edge of a large agricultural field. The inland boundary of the northern end of the site, which is located in a privately owned field outside the project area, remains undetermined.

Environmental Setting

The Persimmon site is located in the lower Illinois River valley in west-central Illinois, on the right bank of the Illinois River in southern Calhoun County, Illinois; because it is located on a sharp bend of the Illinois River, the site lies on the southeastern, rather than the western, bank of the river (Figure 2). The lower Illinois River valley is included within the Illinois River Section of the Upper Mississippi River and Illinois River Bottomlands Natural Division (Schwegman 1973:2). The headwaters of the Illinois River are formed by the confluence of the Kankakee and Des Plaines rivers in northeastern Illinois. From that point, the river flows in a southwesterly direction across central and west-central Illinois, ultimately discharging into the Mississippi River below the town of West Grafton, Illinois. The channel of the Illinois River is relatively straight, with meanders limited to the margins of several large channel islands. The channel width averages

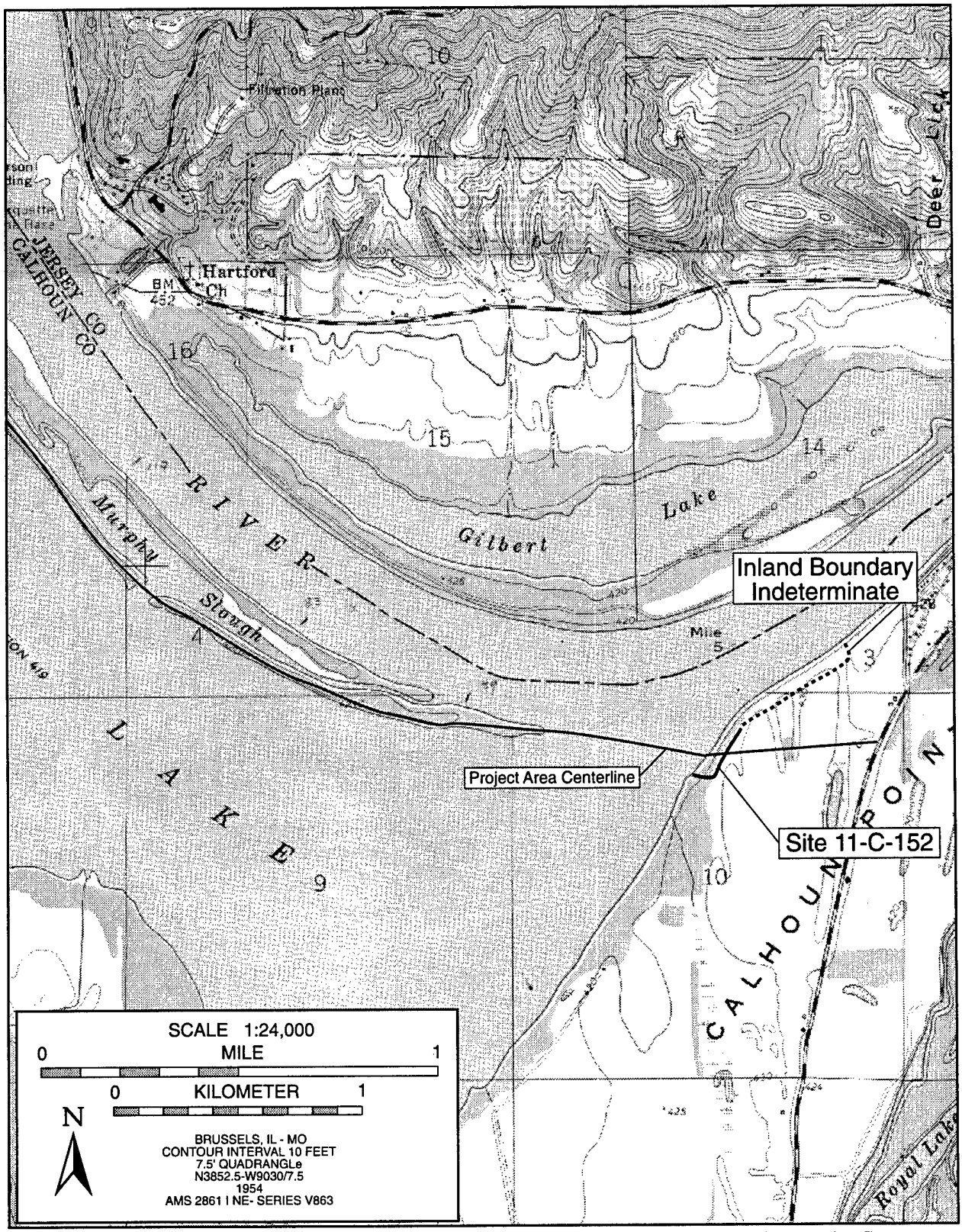


Figure 2. Topographic location of site 11-C-152, the Persimmon site, in relation to the Swan Lake HREP/EMP project area.

350 m. Maximum depth prior to 1902 was approximately 6 m (20 ft.) at bankfull stage (Butzer 1977:13).

The Persimmon site is located in the unglaciated Middle Mississippi Border Division of Illinois. Referred to as the Lincoln Hills Section of the Ozark Plateaus Province (Leighton et al. 1948), this physiographic province represents the northernmost extension of the Ozarks. The rather flat-lying strata of the Lincoln Hills Section produce a heavily dissected landscape characterized by deeply incised drainages and narrow upland ridges that contrast with the high hills produced by the folded and faulted strata in the Salem Plateau in Missouri (Willman et al. 1975).

Geology

The Illinois River valley represents a deep entrenchment of the Illinois River into the flanking uplands contained within the Western Forest-Prairie and Grand Prairie Divisions (Schwegman 1973). The Western Forest-Prairie Division is underlain by Pennsylvanian and Mississippian limestone, sandstone, and shale. Numerous rock outcrops occur along the major streams. Limestone bluffs border the Illinois River valley from its confluence with the Mississippi River to a point approximately 60 miles upstream in Schuyler County (Krey and Lamar 1925). A karst landscape characterized by numerous sinkholes and caves has resulted from the solution of the Mississippian carbonates underlying the uplands of Calhoun County. Several caves have been found in Calhoun County, including Panther Creek, Crater Creek, De Gerlia, Cave Spring and Hardin (Bretz 1961). Sandstone of the St. Peter Sandstone Formation, most commonly measuring from 100 to 200 ft. thick, is exposed in sections of the upper Illinois River valley. Exposed outcroppings of this material occur in the form of sandstone bluffs, canyons, and buttes. The most notable example of the latter type of formation is Starved Rock, a 125-ft-high butte overlooking the Illinois River valley near La Salle, Illinois (Schubert 1986:65-66). Starved Rock, which overlooks the location of the historic Indian settlement known as the Grand Village of the Kaskaskia, is reported to have been the site of a fort constructed by the French explorer La Salle in the seventeenth century.

The geology of the Persimmon site vicinity is dominated by the breaching of the Lincoln Anticline by the Illinois River. Entrenchment of the river has exposed Devonian, Silurian, and Ordovician strata that form steep bluffs along the lower stretches of the river valley (Willman et al. 1975). These outcrops provided the prehistoric inhabitants of the region ready access to important lithic materials. Of primary importance to prehistoric groups in the Lower Illinois River valley would have been chert sources. Naturally occurring chert in the region is found in bedrock exposures, as weathered/residual chert, and as chert redeposited by stream action (Meyers 1970:26). Important chert-bearing limestones located within a three-mile radius of the project area include the Chouteau, Burlington, Keokuk and St. Louis (Meyers 1970:31).

Soils

Fehrenbacher et al. (1984) classified the soils of Calhoun Point, including those occurring in the area occupied by the Persimmon site, as belonging to the Lawson-Sawmill-Darwin association. These soils occur in all of the major floodplains of the state, as well as in the floodplains of many minor drainages. This association, one of the most widespread in the state, comprises 6.5% of the total land area of the state. These dark to moderately-dark colored soils are formed in stratified clayey to sandy alluvium under native prairie and deciduous forests, and are found on nearly level to gently sloping surfaces. In general, the permeability of these soils tends to be moderate, with variable, but mostly poor, drainage (Fehrenbacher et al. 1984).

A more recent, detailed soil survey of Calhoun County has reclassified the soils of Calhoun Point as belonging to the Beaucoup-Tice association (Lilly 1989). This association, which makes up approximately 15% of the county, consists primarily of soils that occur on nearly level floodplains. Beaucoup silty clay loam has been mapped for the Persimmon site area. Beaucoup soils are described as poorly drained, moderately permeable floodplain soils formed in alluvium (Lilly 1989).

The Illinois River valley contains extensive broad floodplains and gravel terraces formed by glacial floodwaters. Backwater lakes and spring bogs are common features along the bluff base (Schwegman 1973:17). The general topography is one of level to rolling plains of sands deposited by glacial meltwaters. Extensive low sandy terraces occur in some areas of the valley (Butzer 1977:17). The floor of the valley is capped by stratified alluvial sediments that are classified as Cahokia Alluvium (Lineback 1979). These sediments occur in the floodplains and channels of modern rivers and streams. The sediments are composed of poorly sorted sand, silt, and clay, and may contain local deposits of sandy gravel (Lineback 1979).

Flora and Fauna

Modern vegetation within the Illinois River valley consists of scrub forests, with black and blackjack oaks as dominant species, and dry, wet, and mesic prairies. Common prairie plant species include big bluestem (*Andropogen gerardic*), with Indian grass (*Sorghastrum nutrans*), wild rye (*Elymus canadensis*), switch grass (*Panicum verigatum*), and slough grass (*Spartine pectinate*) as secondary grass species (Voigt and Mohlenbrock 1964:150).

The bottomland would have contained a wide range of mammalian, avian, and aquatic fauna prior to Euroamerican settlement. Governor Reynolds (1882:232-233) provided the following description of the Illinois River valley as it appeared at the inception of American settlement:

> The region of the country adjacent to the Illinois River . . . produced the strongest vegetation in olden times of any other section of Illinois, and the rivers and swamps adjacent to it afforded the natives more support than any other part of the West.

> The fowls, in the spring and fall in their migrations, stopped here and the Indians killed many of them. Also a great number of musk-rats were caught in the lakes near the river, and it was conceded by all that no river in America produced as many fresh-water fish as the Illinois did. This great supply of provisions for the Indians enabled more of them to subsist in this section of the country than any other in the West.

Semiaquatic fauna that prefers a bottomland environment that would have been found in the Illinois River floodplain prior to American settlement includes the mink (*Mustela vison*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and muskrat (*Onoodatra zibethica*). Other animals that would have been available in both the bottomland and the uplands to the west include the opossum (*Didelphis marsupialis*), gray fox (*Urocyon cineoargentus*), eastern gray squirrel (*Sciurius carolinesis*), fox squirrel (*Scurius niger*) and southern flying squirrel (*Glaucomys volans*), striped skunk (*Mephitis mephitis*), groundhog (*Marmota monax*), and white-tailed deer (*Odocoileus virginianus*) (Shelford 1963). Animal species once present in the region, but now extirpated, include the American elk (*Cervus canadensis*), black bear (*Ursus americanus*), and passenger pigeon (*Ectopoistes migratorius*).

Amphibians and reptiles that prefer a bottomland environment include black racer snakes, the eastern box turtle (*Terrapene carolina*), and the midland painted turtle (*Chrysemys pictamarginata*). Common avian species would have included wild turkey (*Meleagris gallopavo*) and bobwhite (*Colinus virginianus*). Various species of geese, ducks, herons and other waterfowl that frequent the Mississippi Flyway would have been seasonally available.

Butzer (1977) has presented convincing evidence that landforms and vegetation within the Illinois River valley form a dynamic ecosystem that has experienced dramatic change through time. Ancient landforms dating back thousands of years that once represented the original ground surface now lie deeply buried beneath alluvial and colluvial sediments. More significantly, Butzer (1977) notes that modern vegetation conditions within the Illinois River valley date back only to the beginning of the Mississippian period (ca. A.D. 1000). Consequently, attempts to examine earlier prehistoric settlement patterns within the drainage on the basis of modern vegetation patterns or Government Land Office (GLO) data may be in error.

Worthen's (1868:105) account indicates that noticeable changes in the floodplain topography had occurred by the late nineteenth century as a result of siltation caused by the flooding of the Illinois River:

> The soil on this bottom land is a deep sandy loam, formed mainly by the wash from the high lands of the adjacent bluffs, and the sediment deposited by the river, which submerges the lower portion of it during its annual overflows... The surface of these lands is gradually being elevated from year to year by the causes already alluded to; the swampy portions are filling up, and the arable land is thus constantly increasing.

Worthen's (1868:105-106) account also indicates that dramatic changes within the floodplain ecosystem occurred during the nineteenth century as the fertile river bottomland was put into cultivation and the mesic prairies destroyed:

> When the country was first settled these bottoms produced annual crops of most luxuriant grasses, growing oftentimes, in wet portions, to a height [sic] of six or eight feet, and the annual decay of so great an amount of vegetable matter upon the surface produced a malorious atmosphere that was quite deleterious to the health of the early settlers upon these lands. But when the soil was once broken and the ground brought under cultivation over a considerable portion of the surface, and the luxuriant growth of vegetation on other portions was consumed by the herds of cattle that were allowed to graze upon it, the general health of the settlers improved...

Worthen went on to note that:

> ...large crops of corn, wheat, oats, barley, and potatoes...are often grown year after year on the same ground, without manure, and with no perceptible diminuition in the value of the crops (Worthen 1868:105).

Swan and Fuller Lakes were formed by the construction of Lock and Dam 26. A review of the 1827 GLO survey plat for the Swan Lake area indicates that the flood basin inundated by these lakes was covered by wet prairie and forest, while a large portion of the terrace bounding the southern and eastern margins of the present Swan Lake was covered by level prairie. Surrounding forests consisted of an oak-hickory community with maple, elm, ash, willow, and sassafras also being present.

Water levels in the open lake units within the Swan Lake HREP were controlled by Lock and Dam 26 from 1933 to 1990. Since 1990, lake levels have been controlled by the Mel Price Locks and Dam, located downstream from the project area. The results of earlier Bureau of Land Management (BLM) geomorphological studies, as well as those of the present study, indicate that sediments have been accumulating in the Swan Lake HREP at a fairly rapid rate for the past 150 years. This sedimentation rate has increased as a result of lock and dam construction. At least five feet of recent historic sediments have been deposited in the lake bed since 1903, and the Corps of Engineers estimates the sedimentation rate in the project area to be approximately .5 inch of sediment per year. A geomorphological study conducted by the BLM for the Corps in 1994 found that between 36 and 70 inches of sediment was deposited over boundary monuments in the project area since 1935-1940.

Prehistoric Overview

Archaeologists have divided the prehistoric past in eastern North America into four broad chronological periods: Paleoindian, Archaic, Woodland, and Mississippian. These temporal divisions are marked by stylistic differences in artifacts, and correspond to major technological innovations or important shifts in adaptational patterns. The focus of the present study is the Woodland period. This cultural period is customarily divided into three subperiods: Early Woodland, Middle Woodland, and Late Woodland (Griffin 1967).

The appearance of grit-tempered pottery marks the onset of the Woodland period. The Woodland tradition is characterized by a trend toward increased sedentism, intensified horticultural activity, expanding regional exchange networks, and the elaboration of ceremonial activities and mortuary practices (Griffin 1967). These trends can be traced to the Archaic stage, but become more strongly expressed during the Woodland stage. These developmental trends also form the basis for distinguishing the Early, Middle, and Late Woodland substages. There was considerable regional variation in the timing and extent to which these trends were expressed, however, so contemporary archaeological complexes located in adjacent regions may reflect different stages of development.

During the Early Woodland period, the Illinois River valley was hydrologically similar to that encountered by early nineteenth-century Euroamerican settlers (Farnsworth and Asch 1986:327). Broad similarities exist among Terminal Archaic/Early Woodland (1200-600 B.C.) manifestations in west-central Illinois, the Illinois River valley, and the American Bottom. Designated the Prairie Lake culture by Farnsworth and Asch (1986:340), defining characteristics include Kampsville Barbed projectile points and Snyders Grooved plummets. Within the Illinois River valley, Kampsville phase Prairie Lake culture sites have been documented in bluff-base settings. Bluff top burial mounds also occur. Faunal remains indicate exploitation of a wide variety of aquatic and terrestrial species, while floral remains indicate plant harvesting with nut collecting as an important constituent.

Early Woodland temporal and spatial divisions recognized within the Lower Illinois River valley include the Marion phase of the Marion culture, the Cypress phase, and the tentatively defined Schultze phase, of the Black Sand culture, and the Mound House phase of the Initial Havana culture (Farnsworth and Asch 1986:331). Marion phase sites have been identified on both the Mississippi and Illinois River floodplains. Subsistence data indicate the use of upland and bottomland plant species, and the possibility of small-scale horticulture involving squash, barley, and goosefoot (Asch and Asch 1986: 471-473). Although Cypress phase sites may lie buried beneath alluvial flats similar to those of the Swan Lake area, occupation of such areas was probably restricted to short-term exploitative camps (Farnsworth and Asch 1986:406).

The developmental trends characteristic of the Woodland tradition are most strongly expressed in many regions of the Midwest during the Middle Woodland Hopewellian stage. The Hopewellian stage is exemplified by the Hopewell of southern Ohio and the Havana Hopewellian

of the lower Illinois River valley (Muller 1986). Hopewell is most prominently marked by the appearance of large village and ceremonial sites containing geometric earthworks and conical burial mounds, an emerging pattern of social status differentiation (Moffat 1990), and a remarkable expansion of interregional exchange (Brose and Greber 1979; Muller 1986). The Hopewell exchange network, or Hopewell Interaction Sphere (Struever 1964; Struever and Houart 1972), linked a diverse group of regionally distinct, Middle Woodland cultural traditions during the period from about 50 B.C. to A.D. 250.

Middle Woodland sites are numerous in the lower Illinois River valley and occur in a variety of physical settings, including the natural levees of the Illinois River, undissected uplands, alluvial and colluvial fans, adjacent to backwater lakes, in tributary valleys, along the bluff base, and in the floodplain. Middle Woodland floodplain settlements include extractive camps located adjacent to backwater lakes and possible mortuary-related sites (Farnsworth 1976; McGimsey and Wiant 1986; Stafford and Sant 1985). Subsistence data indicate intensive utilization of back water fauna, collection of hickory and hazel nuts, and cultivation of starchy seed annuals including maygrass, little barley, and goosefoot (Stafford and Sant 1985:453).

The end of the Middle Woodland (Hopewell) period at approximately A.D. 400 was marked by a reduction in interregional trade, a decrease in the complexity of ceremonial/mortuary practices, and a reduction in the elaborateness of ceramic decoration. As noted by Nassaney and Cobb (1991:2), the Late Woodland period remains "little studied and enigmatic" despite the large amount of archaeological research conducted over the past 20 years. The period traditionally has been viewed as one of social decline, the result being that "the archaeological remnants of (Late Woodland) culture are frequently studied for what they can tell us about the Hopewellian dissolution or the emergence of the Mississippian culture" (Nassaney and Cobb 1991:1). In contrast to this view, Nassaney and Cobb (1991:1, 6) have characterized the Late Woodland period as a "time of markedly uneven sociocultural development . . . [in which there was] considerable variation in social relations, accompanied by similar diversity in ideology, subsistence, technology, and other realms . . . [this] diversity . . . argues strongly for processes of social stability and transformation in the Southeast that are linked to ecological, political, and economic variation at both local and regional levels." In the same vein, Green (1987:2) argues that Late Woodland research has the potential to provide information on cultural change and continuity in the form of the adjustments that human societies made during this time period to a complex and changing social and biophysical environment.

The White Hall phase (A.D. 450-650) is the earliest Late Woodland phase in the lower Illinois River valley (Styles 1981). Continuity with the preceding Middle Woodland period is reflected in a subsistence base involving the utilization of terrestrial and riverine species, nuts, and cultivated plants. Settlements tended to be small and located in a variety of ecological zones (Conner 1985:2).

The Early Bluff (A.D. 600-800) phase is characterized by an apparent population increase as reflected in an increase in the number, size, and complexity of sites. Although the subsistence

base is similar to that of the preceding Late Woodland phase, the appearance of small projectile points during this time indicates the adoption of the bow and arrow. These trends continue into the Late Bluff (A.D. 800-1,000) phase with the addition of maize, which supplements, but does not replace, other cultigens. Within the American Bottom to the south, the subsistence patterns and ceramic styles associated with the Late Bluff phase gradually change into those of the Mississippian pattern by the end of the Late Woodland era (Conner 1985:3).

CHAPTER II. RESEARCH OBJECTIVES AND METHODS

Steve Titus and Wes Neal

Phase III excavations were conducted at the Persimmon site in order to mitigate the adverse effects of the proposed construction of Pump Station #3 on the cultural deposits present within this portion of the site. This chapter discusses the research objectives guiding the data recovery effort, and describes the methods used to accomplish those objectives.

Research Objectives

An intact cultural deposit associated with both Early Woodland and Late Woodland occupations was identified at the Persimmon site during the Phase I survey, but it appeared the site had been much more intensively occupied during the Early Woodland than during subsequent periods. Consequently, it was expected that test unit excavation within the intact deposit, and excavation of features identified during mechanical stripping, would provide data that could be used to address a series of research questions pertaining to the Early Woodland occupation of the site, and perhaps Late Woodland occupations as well.

Chronology

The survey results indicated that the portion of the Persimmon site located inside the project area contained Early Woodland Black Sand and Late Woodland occupations, but the precise number of components that were present was unclear. The first general research problem to be addressed, therefore, concerned site chronology: determining the age and cultural affiliation of the occupations present at the site. While it appeared likely that hand excavations within the intact cultural deposit would yield diagnostic artifacts that could be cross-dated with well-dated sequences elsewhere in the lower Illinois Valley, it was recognized that the recovery of diagnostic artifacts from datable contexts (features) was more apt to yield temporal data that could be used to refine local culture history. Consequently, the excavation strategy employed during this investigation was designed to accomplish two related, but competing, objectives within the time and budget constraints governing this project: to obtain a sufficiently large, representative sample of the site contents through test unit excavations to ensure recovery of diagnostic artifacts while maximizing the likelihood of identifying features by reserving adequate time for mechanically stripping as much of the terrace as possible.

Site Structure and Stratigraphy

The intact cultural deposit identified at the Persimmon site during the survey was interpreted as a possible midden remnant associated with occupations dating to the Early Woodland and, to a considerably lesser extent, Late Woodland, periods, but the spatial arrangement and level of occupational intensity of the components that were present were not known. Consequently, a major objective of the present investigation was to obtain a clearer understanding of the occupational history of the Persimmon site through documenting its natural and cultural stratigraphy. By examining the vertical and horizontal distribution of diagnostic artifacts in relation to stratigraphic data provided by the geomorphological investigation and test unit excavations, it was hoped that the stratigraphic placement and areal extent of components could be determined. The size, number, and arrangement of diagnostic features identified during mechanical excavations were expected to provide further information on the areal extent of components, as well as evidence concerning the spatial organization, duration of occupation, and function of the components present.

Ceramic Analysis

Recent research in the lower Illinois Valley indicates the extreme southern portion of the valley is relatively unknown archaeologically (Farnsworth and Asch 1986). Since the Persimmon site is located in this portion of the region, its potential for providing information on previously little known, or unknown, local expressions of regional cultural manifestations is significant. The results of the initial site survey suggest the Persimmon site contains a Middle Woodland component (Farnsworth 1976:13, 17; Schroeder 1992:148), and an intact deposit containing Early and Late Woodland components was identified at the site during the Phase I survey. Therefore, excavations at the site might provide an opportunity to test two previously established models concerning the relationship between the Black Sand and Havana cultures within the region: 1) the punctuated equilibrium model (Struever 1968a:147-148), and 2) the twin-tradition model (Farnsworth and Asch 1986:446).

Specific questions formulated to guide the Phase III research at the Persimmon site include the following: 1) Does the Persimmon site ceramic assemblage contain evidence of gradual change, or a transformational phase, between the Black Sand culture and the Havana cultures in the lower Illinois Valley, or 2) does it indicate, instead, that the Black Sand culture was interdicted by a well-developed Havana culture, and, thus, contributed little, if anything, to the culture replacing it in this region?

Lithic Analysis

The Persimmon site lithic assemblage will be analyzed according to material, manufacture, and function in order to determine the types of chert used at the site, the kinds of chipped-stone manufacturing technologies the site occupants emphasized, and the range of activities that occurred at the site. The data generated during this analysis will be used to examine the lithic-procurement

and tool-production strategies evident at the site, and, if temporally discrete lithic samples are available, to identify temporal trends in the strategies employed. The range of site activities, and the lithic-procurement and tool-production strategies identified during this study may, in turn, provide information on the duration of site occupation, site function, and social interaction with groups outside the Illinois River Valley.

Subsistence

The botanical and faunal remains recovered from pit features may provide evidence concerning seasonality, subsistence strategies, and site function for each of the identified components, and indicate changes through time in the plant and animal species being used by the site occupants. Previous research provides little evidence of Early Woodland horticulture in the lower Illinois River Valley (Asch and Asch 1986), so the composition of the botanical samples will be of particular interest in comparing the Persimmon site with other sites of this cultural period in the region. Taken together, the subsistence remains recovered during the present investigation may provide evidence concerning whether the site was occupied on a seasonal, or a multiseasonal, basis, thus suggesting the likely role it played in the local settlement pattern.

Field Methods

In keeping with the Scope of Work for this project, data recovery efforts at the Persimmon site included test unit excavation, mechanical stripping, and feature excavation. These field techniques are outlined below. The methods employed during the geomorphological study carried out at the site are described in Chapter III.

Site Clearing. At the beginning of the fieldwork, the portion of the Persimmon site located inside the Pump Station #3 construction area was covered by second growth forest with a dense understory of saplings, brush, vines, and weeds. Prior to beginning excavation, hand tools and a tractor-pulled brush cutter were used to clear the project area of small trees, underbrush, and flood-deposited debris (Figures 3 and 4). Large trees were left standing, however, thus limiting the extent of excavation in several areas of the site.

Site Grid. After the project area was cleared, Corps of Engineers surveyors staked the construction corridor centerline, the four corners of the pump station structure, and the centerline of the two pump station channels. The Corps survey stakes and an engineering plan of the proposed pump station were subsequently used to locate and mark the boundaries of the project area. A 10 m grid was then established across the project area. Grid north was oriented parallel to the terrace edge, approximately 25° east of magnetic north. The N0 W0 grid station (site datum) was established on the Corps station 20+20.63, at a point on the construction corridor centerline at the eastern edge of the site. The site grid roughly corresponds to the location and orientation of the Phase I shovel testing grid, although the latter extended farther to the west, north, and south than did the grid established during the present investigation.

Figure 3. Clearing the terrace with hand tools, Persimmon site, view to the north.

Figure 4. Clearing the terrace escarpment with a tractor-pulled brush cutter, Persimmon site, view to the south.

Hand Excavation Units. A total of 50 test units was excavated at the Persimmon during this project. The objectives of the test unit excavations were to determine the depth and areal extent of the intact cultural deposit present at the site, and to obtain a representative sample of its contents. These objectives were met using a combination of .5 m x .5 m, 1 m x 1 m, and 1 m x 2 m test units. The Scope of Work specified the maximum number of test units of different dimensions to be excavated at the site, and the criteria to be used for unit placement, and these specifications were modified, as necessary, following field conferences with the District archaeologist.

Each test unit was excavated in arbitrary 10 cm levels to culturally sterile soil, and all excavated soil was screened through 1/4 in. mesh. All cultural material was bagged and catalogued by test unit and excavation level. The base of each of the excavated levels and the walls of each of the units were troweled and carefully inspected. An excavation form was completed for each level excavated, and at least one wall profile of each test unit was drawn and photographed.

A total of thirty-eight .5 m x .5 m test units was excavated on the 10 m grid that had previously been established across the project area. Each of these units was identified by the grid coordinates of the southwest corner, as well as by an alphanumeric designation. In several sections of this report, the .5 m x .5 m test units also are referred to by topographic location, the group of 10 units excavated on the terrace being distinguished from the group of 28 units excavated on the terrace escarpment.

A total of ten 1 m x 2 m test units was excavated at the site. All of these units were excavated on the terrace in order to investigate further the intact cultural deposit identified in this area (Figure 5). Each of the 1 m x 2 m units was identified by a numeric designation, and their locations recorded using the grid coordinates of their southwest corners. Test Units 1-8 were systematically placed along the terrace margin and the eastern boundary of the project area, and Test Units 9 and 10 were placed in an area of high artifact density identified during the previous test unit excavations.

Following the completion of the 1 m x 2 m test unit excavations, soil samples were taken from five of the units and saved for flotation in order to recover small botanical and faunal remains. The procedure used to obtain these samples involved the excavation of a .25 m x .25 m column in one wall of each of the five units selected. Each soil column was excavated in natural strata, and all of the soil from each stratum was collected, labeled, and analyzed as a unit.

During the mechanical stripping operation (described below), two 1 m x 1 m test units were excavated from a machine-stripped surface in order to determine whether a deeply buried paleosol identified during the geomorphological investigation contained cultural material. Both of these units were identified by a numeric designation (Test Units 11 and 12), and their locations recorded using the grid coordinates of their southwest corners.

Figure 5. Hand excavation of 1 m x 2 m test units along the terrace margin, Persimmon site, view to the north (Illinois River in the background, on the left).

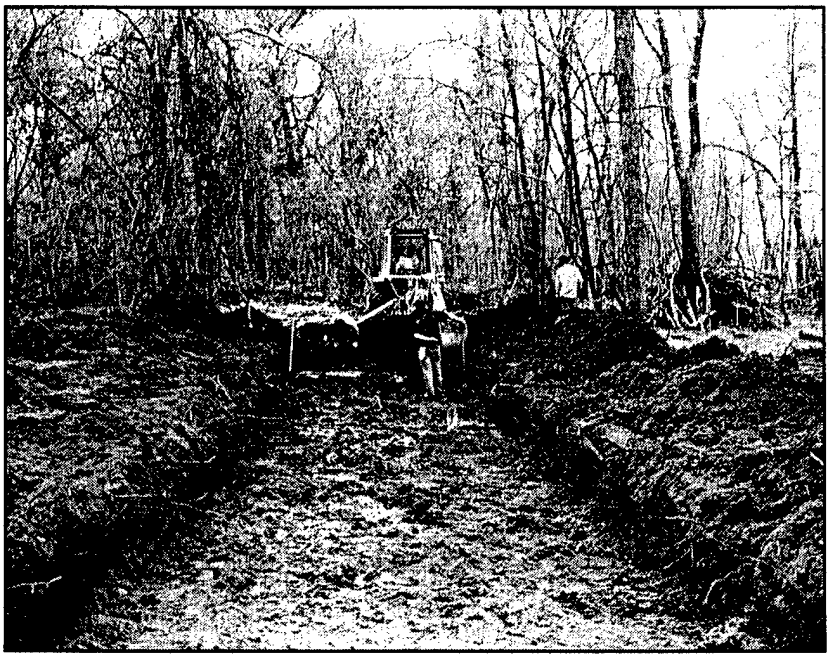


Figure 6. Mechanical stripping along the terrace margin, South Stripping Block, Persimmon site, view to the south.

Mechanical Stripping. Mechanical stripping was implemented at the site following the completion of test unit excavations. This procedure involved the mechanical removal of the alluvial cap and the underlying cultural deposit in order to expose subsurface features. Using a backhoe with a toothless bucket, a large block was stripped along the terrace and upper terrace escarpment through the excavation of a series of broad, contiguous trenches (Figure 6). Stripping proceeded slowly, and was extended to an average depth of 60 cm below surface (BS). On a typical pass, 5 to 10 cm of earth was removed by the backhoe. One or more archaeologists followed the backhoe in order to flag potential features and collect the diagnostic artifacts exposed after each pass. The backhoe operator was able to cut a clean enough surface that shovel scraping was not necessary in most areas. Upon completing a section of stripping trench, all possible features were investigated.

The mechanically stripped area at the Persimmon site consists of a single, linear block that parallels the run of the terrace edge. Three general proveniences are referred to in this report, however, when discussing the distribution of artifacts collected during the mechanical stripping operation: the East/West Stripping Trench, and, on either side of this trench, the North and the South Stripping Blocks. The East/West Stripping Trench corresponds to the stripped surfaces exposed along Deep Testing Trench 2 (described below) prior to its excavation.

Deep-Testing Trenches. Two deep-testing trenches, Deep Testing Trenches 1 and 2, were excavated at the site during the geomorphological investigation. Using a backhoe with a toothless bucket, the trenches were first stripped to subsoil following the procedure described above. One or more archaeologists monitored this portion of the excavation in order to identify potential features. Deep Tench 1 was subsequently extended to a depth of approximately 4 m, and Deep Testing Trench 2 to a depth of approximately 1.5 m.

Feature Excavation. Features were defined on the basis of differences in soil color and/or cultural material density within and without the feature, and were excavated by hand. Each feature was photographed and mapped in plan view, cross sectioned, and photographed and mapped in profile. Feature fill was screened through 1/4 in. mesh, and all cultural material was provenienced by feature and collected for analysis. A 10 liter flotation sample was collected from the fill of each feature to provide material for subsistence analysis and charcoal samples for radiocarbon dating. A screened bulk soil sample also was taken from certain features for potential radiocarbon dating purposes.

Site Mapping. A map showing the location of test units, features, mechanically stripped areas, and deep-testing trenches in relation to the project area boundaries was prepared using a transit and tapes. This map was subsequently superimposed upon a Corps of Engineers contour map of the project area to produce the site map included in this report.

Laboratory Methods

Following the completion of the field work, all recovered materials were processed at the laboratory facilities of American Resources Group, Ltd., in Carbondale, Illinois, where they were washed, sorted, and cataloged. Artifacts were sorted into general categories, such as lithics and ceramics, and were then sorted into analytical categories, counted, and weighed. The artifact categories used in the detailed analyses are presented in the chapters describing the results of the lithic and ceramic studies.

The flotation samples collected from test units and features were processed through a mechanical agitation method of water flotation similar to the TRAP machine described by Dye and Moore (1978). The processed flotation samples were air dried, and obvious contaminants, e.g., roots, were removed. A wood charcoal sample from Feature 3, a bulk soil sample from Feature 1, and two bulk soil samples from the deep-testing trenches were submitted to Beta Analytic, Inc., of Miami, Florida, for radiocarbon dating. The remainder of the flotation materials was submitted to Kathryn E. Parker of Great Lakes Ecosystems, Indian River, Michigan, for botanical analysis, and Elizabeth Scott, St. Mary, Missouri, for faunal analysis.

Curation

All cultural materials collected from the Persimmon site during the survey and excavation stages of this project, as well as the project notes, photographs, and other data generated during the performance of these contract services, are being temporarily curated at American Resources Group, Ltd. This allows access to these materials during the analysis and report writing stages of this project. The St. Louis District has a curation agreement with the Illinois State Museum, Springfield, and all materials from the project will be curated at that facility.

CHAPTER III. GEOMORPHOLOGICAL INVESTIGATION

Jeff Anderson

Introduction

Geomorphological investigations were conducted along the proposed construction corridor at the Persimmon site in Calhoun County, Illinois, April 17-24, 1995. The investigations used sampling tube cores and backhoe trenches to examine the deposits along the proposed construction site. The results indicate that the surface is capped by late to very late Holocene Illinois River coarse grained alluvium. This deposit contains a surface A horizon, and a buried A-B horizon sequence. The buried A-B horizon sequence produced intact cultural materials. Below, an older, well sorted, finer grained Holocene deposit contains another buried (ABtb or Btb) horizon.

Earlier work conducted by Hajic (1987) developed landscape assemblages, and addressed landscape archaeological potential in the lower Illinois River valley. A series of large-scale plates was created showing the landform archaeological potential and the distribution of late Wisconsinan and Holocene deposits in the valley. Through a considerable amount of subsurface coring, Hajic (1987) identified 20 lithostratigraphic units contained in the lower Illinois valley and related these deposits to valley evolution. The work included 21 radiocarbon dates from the Illinois valley, 8 of which came from the Swan Lake-Buck Lake paleochannel area. From the stratigraphic and radiometric work, 13 provisional stages of lower Illinois valley late Wisconsinan and Holocene evolution were indicated. The identified stages range in age from about 15,000 B.P. to the present.

At Stump Lake, Illinois River Pool 26, natural levee deposits were found to contain buried surfaces of late Holocene age, although no buried archaeological sites were found on these buried surfaces (Titus et al. 1995). The Illinois River deposits across from Stump Lake in the Swan Lake project area contain deposits from about the early Holocene through the historic period.

Quaternary History

The chronology of upper Mississippi/Illinois valley drainage events during the Pleistocene remains obscure. During the early Pleistocene, the middle reach of the ancient Mississippi River follows the same general course as the present Illinois River from Hennepin to Peoria and southward toward St. Louis. Later, drainage patterns of the ancient Mississippi/Illinois system changed during Illinoian glaciation. These changes diverted the ancestral Mississippi/Illinois

drainage westward. Following Illinoian glaciation, drainage reverted back through the Princeton Bedrock valley and into the Illinois River valley.

Studies conducted by Wickham (1980) and Lineback (1979) indicate that possibly six to seven glacial/interglacial fluctuations have occurred between 500,000 and 120,000 B.P. (Lineback 1979). Following these events, the Sangamon interglacial stage is generally thought to have begun after the last Illinoian glaciation around 125,000 B.P. and continued to about 60,000 B.P.

The oldest Wisconsinan aged deposits found in the area include a loess deposit, the Roxanna Silt (Follmer et al. 1979). The loess was deposited between about 45,000 - 30,000 B.P. In places, a weak Farmdalian Soil has been developed in the silt. The Farmdalian Soil that developed between about 22,000 and 28,000 B.P. is a widespread time stratigraphic marker and has been recognized at other Midwest locations (Anderson 1986; Anderson 1991).

During the Wisconsinan the ancient Mississippi drainage through the Illinois valley was abandoned. By about 20,000 B.P., the Mississippi was finally diverted to its present course through the Port Byron and Andalusia Gorges south of Clinton, Iowa (Anderson 1968).

Following permanent Mississippi River diversion from the Illinois River valley, Woodfordian glacial advances covered the upper portion of the Illinois valley. The pattern of the Woodfordian moraines in Illinois indicates a minimum of 32 episodes of moraine building in an interval from 14,000 to 20,000 B.P. (Willman and Frye 1970). During moraine building episodes near Chicago, drainage from major glacial lobes (Lake Michigan Lobe, Saginaw Lobe, and the north side of the Erie Lobe) was discharged into the Illinois River System. These discharges were known as the Kankakee Flood where existing valleys and outlets were inadequate to accommodate the high magnitude flows.

Woodfordian glaciers reached the Peoria area around 19,000 B.P. (Follmer et al. 1979). The maximum extent of Wisconsinan glaciation was north of Swan Lake and the Persimmon site through central Peoria and Tazewell counties. To the east of these counties lies the Bloomington Morainic system with several different till members. To the southwest of the Bloomington-Moraine, large outwash deposits are present in the Illinois River valley. The outwash has formed a series of complex late Woodfordian terraces which now lie above the modern floodplain. Among the terraces is the Mississippi River Savanna or Zwingle (Flock 1983; Bettis and Hallberg 1985), and the Deer Plain in the lower Illinois valley (Hajic 1987).

Eolian reworking and deposition of fine sand took place during the waning stages of glaciation and formed a complex system of dunes (Parkland Sand). In the Illinois River valley, dunes developed episodically from about 15,000 B.P. to about 10,600 B.P. during periods of relatively low stream discharge (Hajic 1987). Dunes are recognized along portions of the valley between Pekin, Illinois and the Swan Lake paleochannel.

Ice had withdrawn from the headwaters of the drainage systems affecting Illinois by the end of the Woodfordian. However, the Illinois system was still receiving periodic discharges from the Great Lakes. Major river systems including the Illinois, ceased valley aggradation in favor of valley incision and floodplain abandonment. From about 9700 B.P. to 9600 B.P. major valley incision occurred in the Illinois valley, and the Swan Lake-Buck Lake paleochannel became activated along the west valley wall (Hajic 1987). Generally, following the episode of valley incision, periods of valley alluviation proceeded in the lower Illinois during the Holocene.

Methods

Subsurface investigation consisted of 13 sampling tube cores and two deep testing trenches (Figure 7). A few of the cores were advanced off-site to the east in order to place the site in a larger geologic context. The remaining cores and trenches were placed on-site and were used to help construct a general site geologic cross section. Deep Testing Trench 1 was excavated to a depth of about 4 m in order to obtain organic material to be used for a radiocarbon sample (Figure 7). Shallow groundwater made deeper trenching impossible, so the full extent of the Holocene fill at the Persimmon site could not be determined. Deep Testing Trench 2 was oriented perpendicular to the Illinois River natural levee axis in order to help expose archaeological deposits and features, to construct a geologic cross section, and to examine the erosional surfaces riverward from the top of the levee (Figure 7). Sampling tube cores reached a maximum depth of 375 cm, and Trench 2 extended to the water table, which was about 120 cm below the surface.

The work was performed in accordance with the "Guidelines for Geomorphological Investigation in Support of Archaeological Investigations " established in Iowa during 1992. The soil profiles were described according to color, texture, structure, consistence, sorting, special features (roots, pores, voids, mottling, gleying, concretions, organics, lamellae, laminae, krotovina, clay skins) effervescence, and/or pH, and horizon boundary. Colors of the deposits will be determined with a Munsell color chart. Soil field pH was determined through the use of a Hellige-Truog soil pH kit, and effervescence was determined through the application of a weak (14%) hydrochloric acid solution. Four soil samples for radiometric dating were submitted to Beta Analytic Inc., for analysis. The soil profiles were described according to taxonomic nomenclature used in Midwest Quaternary and soils studies. Vegetation, depth to the water table, and core/trench depth were recorded at each location. Photographic documentation of the investigations using color slide film was conducted during this stage.

Trench 2 and the soil cores adjacent to Trench 2 were surveyed for relative elevation in order to obtain stratigraphic control and aid in the development of two cross sections. Sampling tube (ST) cores ST1 and ST9-13 were not surveyed. Sampling tube cores ST10-13 were advanced along a second transect located about 25-30 m south of the Trench 2 (Figure 7). This second transect was conducted for verification purposes and to help determine the lateral extent of the depositional/erosional units. The reader is encouraged to review the detailed soil profile descriptions from the sampling tube cores in Appendix B, and to examine Figures 8 and 9, which

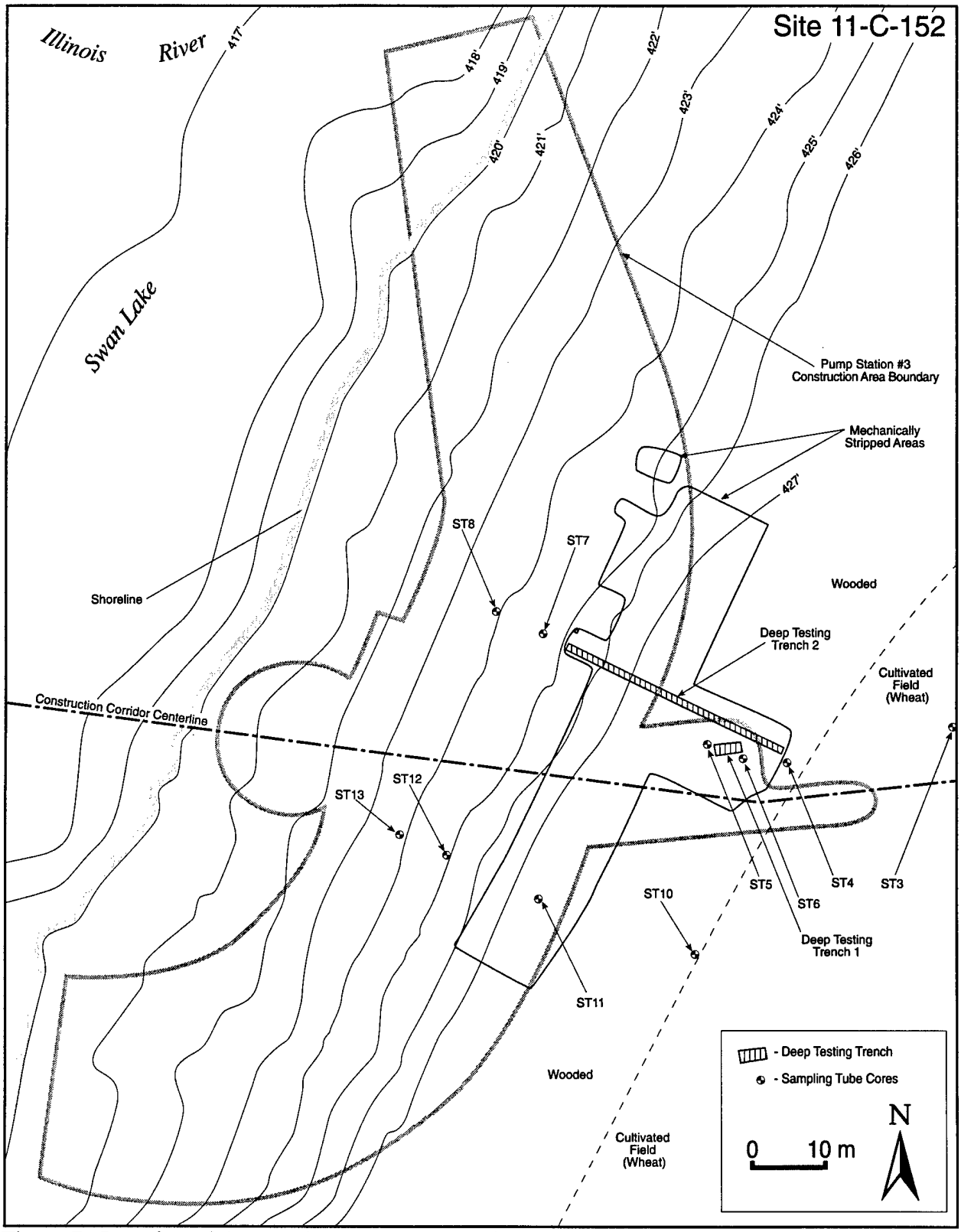


Figure 7. Location of deep testing trenches, sampling tube cores, and mechanically stripped areas, site 11-C-152, Pump Station #3 construction area, Swan Lake HREP/EMP. (Note : ST1, 2, and 9 are east of ST3, off this figure.)

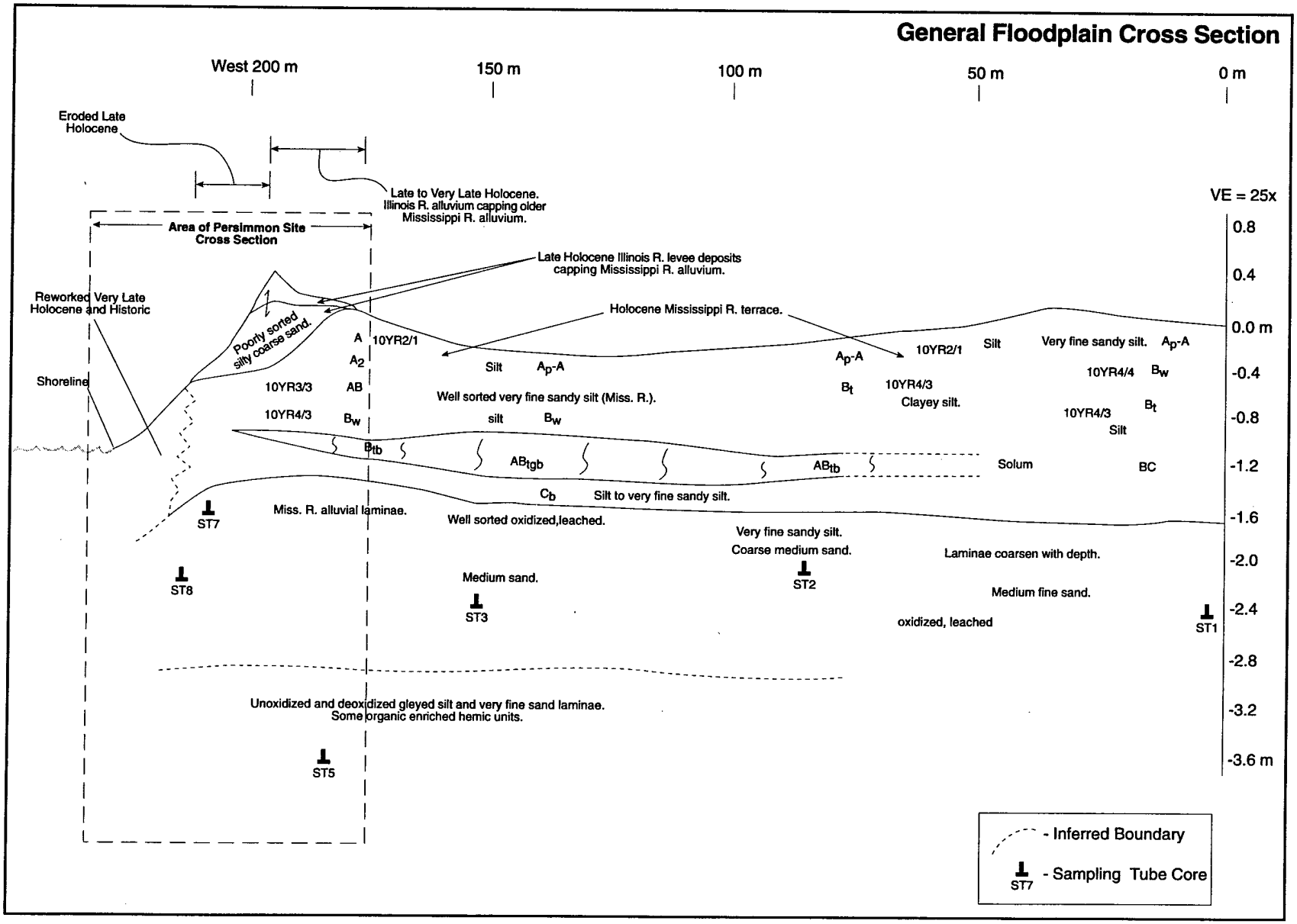


Figure 8. General floodplain cross section, Pump Station #3 vicinity, Swan Lake HREP construction corridor (Note : ST9 is to the right, or east, of ST1 and not on this figure).

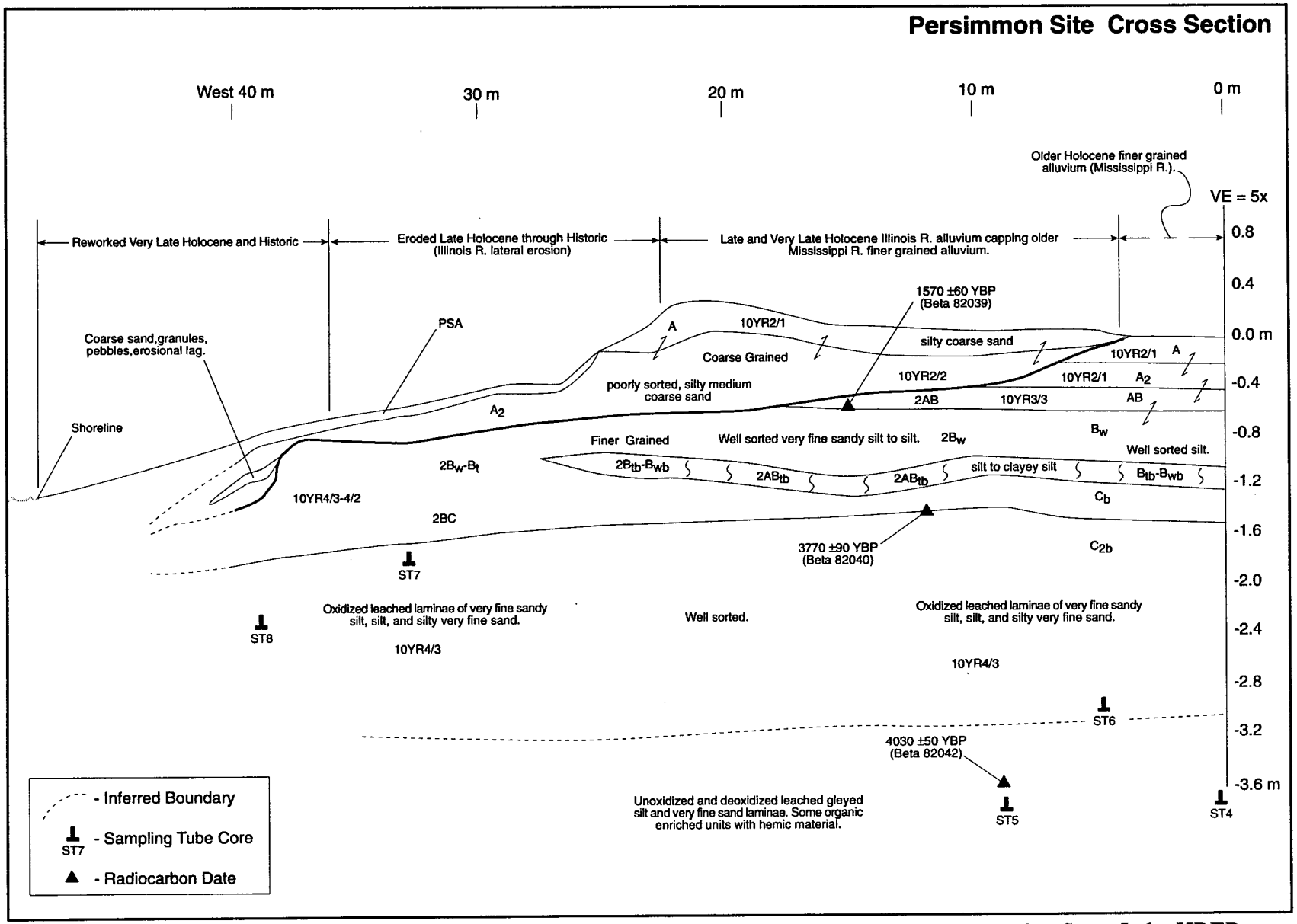


Figure 9. Persimmon site cross section, Pump Station #3, deep testing trenches, and ST4 - ST8 composite, Swan Lake HREP.

show the stratigraphic units observed along Trench 2. In addition, 10 backhoe trenches and 34 sampling tube cores were examined during the previous fall in the Swan Lake general vicinity. These data including radiocarbon dates can be found in Titus et al. 1995.

Results

Generally, the main alluvial deposit consists of well sorted, oxidized Mississippi River very fine sand and silt of Holocene age. Post 4000 B.P. deposits lie within the upper 4 m of the deposit. The Holocene sequence probably does not extend much deeper since the overall trend was a coarsening in flood laminae below 3 m and some sampling tube cores as well as the deep trench showed an overall coarsening to medium sand. The radiocarbon evidence clearly indicates rapid valley alluviation occurring between about 4000 B.P. and 3700 B.P.

During the late Holocene, coarser grained, more poorly sorted Illinois River levee deposits capped the finer grained, well sorted Mississippi River alluvium. The Illinois began eroding laterally into the older Holocene surface while capping the Mississippi River terrace some distance away from the channel margin creating an Illinois River natural levee. Soil development with brief periods of aggradation proceeded in the levee deposit during the late Holocene while cultural occupation occurred. Late to very late Holocene flooding episodes continued and laterally eroded eastward into the terrace, and began eroding the occupational surface, while adding levee deposits to the surface away from the terrace margin. Consequently, away from the channel margin, the formerly occupied surface was buried by the late to very late Holocene levee deposits while the deposits closer to the channel margin were eroded. This process has continued into the present where recent historical alluvium caps a portion of the surface away from the channel margin and erodes the terrace near the channel margin.

In the field east of the Persimmon site, a ridge and swale topography was observed with the ridges and swales generally trending NNE to SSW, and indicate a Mississippi River channel origin. The Brussels USGS topographic quadrangle similarly indicates a Mississippi origin for the deposit, as does Hajic (1987) who has assigned three Mississippi River sediment assemblages for this portion of the valley.

Figure 8 shows the general east/west cross section. The deepest basal deposits along the cross section are found in ST5, and are composed of leached deoxidized to unoxidized laminae of flood silt and sand with organic plant material. An acorn cap, tree bark, and twigs were identified in this unit. The abundant organics, which were thinly bedded between the sand and silt laminae, were radiocarbon dated to 4030+/-50 B.P. (Beta-82042)(Figure 9). Permanent gleying began at about 3 m below the surface, and the organics were recognized from about 3.5 m to 4 m. These leached deposits were in or near channel flood alluvium.

Above this unit, oxidized leached silt and very fine sand flood laminae were identified in the sampling tube cores (Figure 8). A few of the cores indicated coarser grained medium sand as

a flood deposit component. This unit generally ranges in depth from about 1.5 m to about 3 m below the surface. These are emergent vertical accretion Mississippi River levee/terrace deposits.

Pedogenically altered horizons occur from the surface to about 1.5 m (Figure 8). A paleosol occurs in the lower portion of the upper Mississippi River unit from about 1.0 to 1.5 m. The thickness of the paleosol varies but is generally around 20-30 cm thick. The paleosol is observed to pinch out in Trench 2 toward the Illinois River, and it could not be identified in the two easternmost cores (ST1 and ST9).

Just below the paleosolum, some organics and charcoal were recovered from Trench 2 at 1.4 m below the surface that yielded a radiocarbon date of 3770+/-90 B.P. (Beta 82040)(Figure 9). The indication is that a little more than 2.0 m of vertical accretion occurred at this location over a 300 year period and based on the radiocarbon date, the paleosol apparently developed after 3770 B.P., and was later buried by either Mississippi River or both Mississippi River and Illinois River alluvium. The paleosol probably was the surface from about 3700 B.P. to approximately 3000 B.P. to 2500 B.P. Since this Mississippi River terrace lies about 10 ft. above the Swan Lake flood basin, Illinois River impacts were probably limited until after about 3000 B.P. Meanwhile, the topographically lower Illinois River flood basins experienced active aggradational and degradational episodes (Hajic 1987).

The W20 location along the Persimmon site cross section (Figure 9) shows the thickest Illinois River levee deposits and cultural deposits. Here, vertical accretion resumed after about 3000 B.P. An additional minor amount of Mississippi River alluvium was capped by about 0.8-0.9 m of Illinois River alluvium. To the east, between W5 and W0, the surface stabilized and soil development resumed in Mississippi River alluvium (Figure 9). West of W20, closer to the Illinois River, coarse grained flood alluvium capped a portion of the Mississippi River terrace and laterally eroded the terrace close to the Illinois River channel margin. No paleosol was observed at the contact between the Mississippi River alluvium and the overlying Illinois River alluvium, which indicates that this vertical accretion process occurred rapidly. Interfingering between Mississippi River sediment and Illinois River sediment did not occur, indicating a relatively abrupt change in hydrology at the Persimmon site.

A period of relative stability at the Persimmon site occurred probably from around 2300 B.P. to about 2000 B.P. as soil profile development and cultural occupation existed on the levee-capped terrace. The distribution of cultural materials indicates that site occupation occurred while Illinois River flood deposits periodically aggraded the levee. An organically enriched soil sample taken from the bottom of a pit feature, at a depth of 60-70 cm below surface, returned a radiocarbon date of 1570+/-60 B.P. (Beta-82039)(Figure 9). The recovery of Early Woodland ceramics from this feature, however, indicates this date is unacceptably young. It is likely that the soil sample taken from this feature was contaminated by organic material from the overlying deposit (A horizon).

The general and Persimmon site cross sections show the Illinois River levee deposit capping a small portion of Mississippi River terrace (Figure 8 and 9). A surficial, coarse grained unit caps the older culture-bearing levee deposit. The surficial unit is of very late Holocene age and accumulated as increased flooding resumed during the last 1,000 or so years. The result was to further laterally erode the Mississippi terrace and Illinois River levee deposits near the Illinois River channel margin, and to cap a small portion of the terrace with additional coarse grained levee deposits. Lateral Illinois River erosion has continued into the historic period as the levee capped terrace margin has continued to erode while PSA caps a portion of the eroded terrace close to the Illinois River channel margin.

Conclusion

The Persimmon site has an interesting and complex natural history. The site is found on a Mississippi River terrace lying about 10 ft. above the Swan Lake paleochannel/flood basin. The terrace is capped by late and very late to historic aged Illinois River alluvium. Hajic (1987) indicates that during Stage VII (9700 B.P.-9600 B.P.) the Illinois River established the Swan Lake paleochannel along the western margin of the valley. From about 9600 B.P. to about 7000 B.P. the Illinois River aggraded in response to apparent hydraulic and sediment damming from the Mississippi River. The current investigation tends to support this interpretation, and sediment/hydraulic damming from the Mississippi River apparently continued into the late Holocene based on the current radiocarbon chronology. Aggradation of at least 2 m of Mississippi River alluvium at the Persimmon site occurred between 4000 B.P. and 3700 B.P.

The current investigation indicates that Mississippi River gleyed deposits of fine sand and organic debris accumulated during the late Holocene around 4000 B.P. Near-channel Mississippi River overbank deposits accumulated at the site until about 3700 B.P. when stability and soil development occurred on the terrace. Illinois River valley aggradation continued on the lower surfaces to about 3000 B.P. based on Hajic's (1987) work, and is followed by increased flooding and flood basin scour. The higher Mississippi River terrace appears to have stabilized after 3700 B.P. as recognized by soil profile development.

Following terrace stability, renewed Mississippi River alluviation added additional sediment. In addition, channel migration probably began as the Mississippi channel moved laterally to the southeast, occupying areas now known as Coon Lake, Royal Lake and Silver Lake. The effects of Illinois River System on the Persimmon site terrace became evident. The apparent change in hydrology may have initiated a response of scour in the Illinois System. Hajic (1987) indicates that the Illinois River, during stages X and XI, scoured flood basins and sandy terrace margins, then the Illinois System experienced renewed alluviation, minor channel changes and levee construction from around 3000B.P. to 2500B.P. The Persimmon site Mississippi River terrace may have experienced some lateral erosion during this period.

Sometime after about 3000 B.P. to 2500 B.P., but before about 2300 B.P., renewed Mississippi River and Illinois River flooding added sediment to the terrace. The Mississippi added the last increment of very fine sand and silt. Very shortly after, the Illinois was abutting the terrace and laterally eroding into the older deposit while constructing a levee further away from the channel margin. It appears that the time interval separating the last Mississippi River deposit from the overlying Illinois River levee deposit was probably short. Interfingering of the Illinois and Mississippi River alluvium was not evident in Trench 2 or sampling tube profiles. Relative stability and soil development, interrupted by brief periods of aggradation, followed as the levee-capped terrace was culturally occupied.

After about 1000 B.P., renewed Illinois River flooding laterally eroded the terrace and added another thin levee deposit capping the older occupied surface. This episode may have been in response to the gradual southeastward migration of the Mississippi River to its present position, and a possible shift of the Illinois River channel to its contemporary channel, but this is speculative.

A radiocarbon sample east of the Swan Lake paleochannel was collected from a levee deposit adjacent to the contemporary Illinois River channel that provided a date of 1480+/-70 B.P. (Beta 77131) from a depth of 200 cm below the surface (Titus et al. 1995). Historical alluvium caps the upper 80 cm of the profile. It is unknown how deep the levee deposits extend along this narrow NW-SE trending ridge between Swan Lake and the existing channel. However, several sampling tube cores and backhoe trenches indicate that the ridge probably formed after about 2000 B.P.

Valley alluviation and lateral terrace erosion has continued during the very late Holocene and into the historic period in this portion of the lower Illinois valley. Raised pool levels have accelerated lateral erosion of the Persimmon site Mississippi River terrace, and considerable historical deposits have filled the lower late to very late Holocene surfaces in the Swan Lake area (Titus et al. 1995).

CHAPTER IV. FIELD INVESTIGATIONS

Steve Titus

This chapter describes the Phase III excavations conducted at the Persimmon site during the last three weeks of April 1995. The research goals and field methods employed during this investigation were derived from information obtained during previous archaeological surveys of the site. Accordingly, these previously conducted investigations are reviewed in some detail before turning to the results of the present investigation.

Illinois River Shoreline Survey: 1975

The Persimmon site was first recorded in 1975 during an Illinois River shoreline survey conducted by the Northwestern University Archaeological Program, Kampsville, Illinois, for the St. Louis District, U.S. Army Corps of Engineers (Farnsworth 1976). Both the east and west banks of the Illinois River between river mile 0 and 80 were surveyed during this investigation. The survey consisted of the visual examination of the ground surface along a corridor extending inland 300 ft. from the river shoreline. No shovel testing was conducted, so only visible ground was included in the survey.

The Persimmon site was identified as a large, multicomponent habitation site located on a terrace a short distance downstream from the confluence of Swan Lake and the Illinois River (Illinois Archaeological Survey 1975). The site was defined as a heavy concentration of chert flakes and sherds along a 565-m-long section of beach and eroded riverbank bounding the terrace on the north and west. At the time of survey, ground surface visibility was very poor in the cultivated fields bordering the riverbank along the northeastern end of the site, so the inland limits of the material scatter could not be determined (Figure 2). The artifact scatter observed in the wooded area at the extreme southwestern end of the site was found to extend from the shoreline to the edge of the cultivated field, a distance of approximately 110 m. A sand ridge was observed along the terrace margin in the wooded area at the southwestern end of the site. A buried midden containing chert flakes and sherds was identified on the flank of the sand ridge facing the beach. The midden deposit, which appeared to extend to the surface in several places, also contained a feature consisting of a concentration of burned limestone (Illinois Archaeological Survey 1975).

Diagnostic artifacts recovered during the initial site survey included a Belknap point, lamellar flakes, a hoe resharpening flake, and a number of "Jersey Bluff-like" sherds, thus indicating the Persimmon site contains Early Woodland, Middle Woodland, and Late Woodland components (Farnsworth 1976:13, 17; Schroeder 1992:148). Site 11-C-153, the Duck Blind site, was also recorded during the shoreline survey, although this site actually represents a historic Euroamerican component at the Persimmon site.

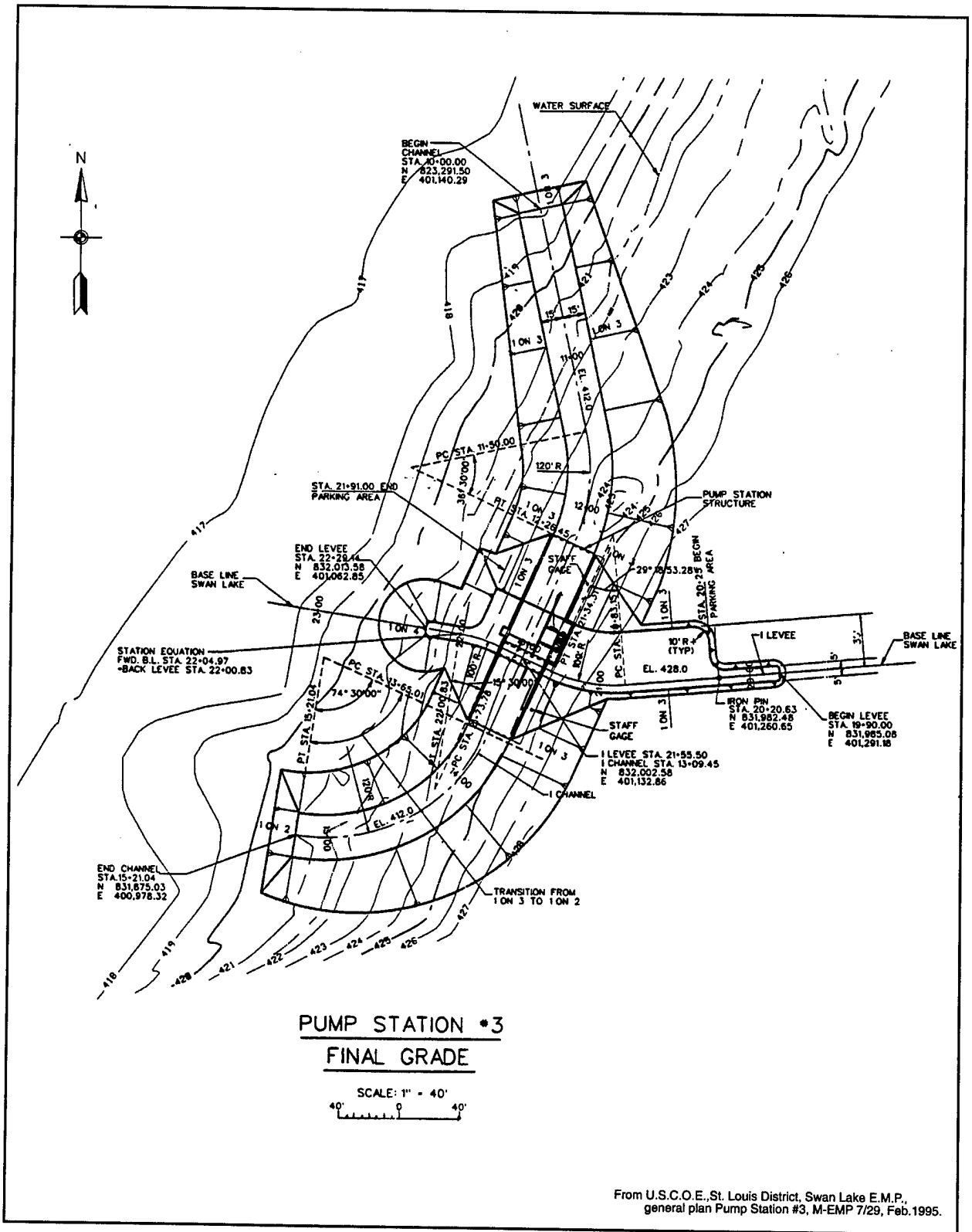
The Persimmon site was interpreted as a large base camp (Farnsworth 1976:37). Despite evidence of the site having sustained a considerable degree of erosional disturbance, which was estimated to have resulted in the destruction of 10-40% of the site, it was judged to have high research potential. Accordingly, the Persimmon site was evaluated as being potentially eligible for listing to the National Register of Historic Places (Farnsworth 1976:37).

Swan Lake Survey: 1994

During the 1994 Phase I survey of the Swan Lake HREP project area (Titus et al. 1995), the Persimmon site was found to extend into the proposed construction area of Pump Station #3 (Figure 2). The Phase I investigation included a surface survey of the Swan Lake and Illinois River shorelines, and shovel testing of the terrace and its western escarpment inside the project area. A preliminary geomorphological assessment of the Persimmon site was carried out at this time as well.

The shoreline survey was extended a considerable distance outside the project area during the Phase I investigation in order to determine the northeastern and southwestern boundaries of the site, and to obtain a sample of the site contents. During the shoreline survey, a continuous scatter of prehistoric artifacts was observed along the full length of the narrow, sandy beach that bounds the Persimmon site on the north and west (Figure 2), but artifact density was highest along the portion of the shoreline located within the project area. The southwestern boundary of the site was subsequently extended approximately 260 m south of the site limit reported by Farnsworth (1976) in order to encompass the full extent of the artifact scatter observed during the 1994 survey of the Swan Lake shoreline (Titus et al. 1995).

Screened (1/4 in.) shovel tests were excavated on a 10 m grid within the proposed construction area of Pump Station #3 and its associated channels, and the construction corridor of the exterior levee and the pump station access road (Figure 10). A total of 130 shovel tests was dug in the site area, and 39 of these contained cultural material (Figure 11). The number of artifacts found in the shovel tests varied from a maximum of 11 to a minimum of 1. Artifact density within the project area was highest on the terrace and high on the upper slope of the escarpment. The shovel testing results indicated that the inland boundary of the portion of the Persimmon site contained within the project area is located approximately 20 m east of the terrace edge, in a wooded area bounding the western edge of a large agricultural field (Figure 11). The inland



From U.S.C.O.E.,St. Louis District, Swan Lake E.M.P., general plan Pump Station #3, M-EMP 7/29, Feb.1995.

Figure10. Construction plan of proposed Pump Station #3 and associated channels, exterior levee, and pump station access road, Swan Lake HREP/EMP.

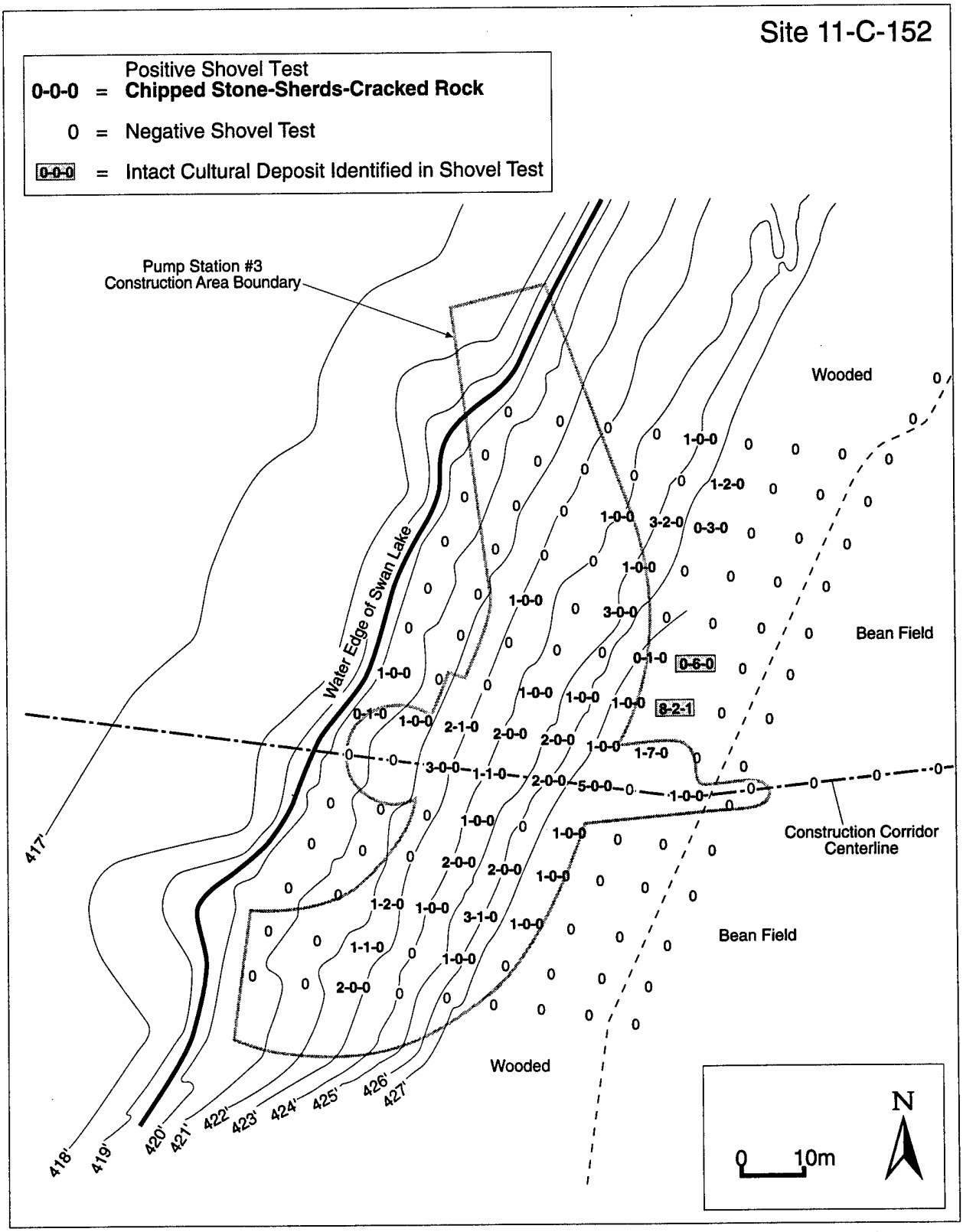


Figure 11. Site 11-C-152 plan after Phase I survey (1994), Pump Station #3 construction area, Swan Lake HREP.

boundary of the northern end of the site, which is located on private property outside the project area, remained undetermined (Farnsworth 1976)(Figure 2).

No artifacts were recovered from the vast majority (79%) of the 42 shovel tests excavated within 20 m of the dense artifact concentration observed along the Swan Lake shoreline in the project area (Figure 11). This pattern suggested that a substantial portion of the terrace, and the site formerly occupying it, have been removed by erosion, the artifacts observed along the Swan Lake shoreline being deposited there in the process. The horizontal and vertical artifact-distribution patterns identified during shovel testing farther upslope on the terrace escarpment provided further evidence in support of this interpretation. Only one of the 25 positive shovel tests excavated on the terrace escarpment yielded more than three artifacts (Figure 11), and all of the artifacts recovered from these tests were found within a 25-cm-thick layer of black 10YR2/1 sandy silt that appeared to represent flood-deposited sediments of post-occupational origin; typically, this surface deposit was underlain by brown 10YR5/3 clayey silt near the Swan Lake shoreline, and by dark grayish brown 10YR4/2 silty sand farther upslope. By contrast, four of the 13 positive shovel tests excavated on the terrace yielded more than three artifacts, and two of these produced eight or more artifacts (Figure 11).

The two shovel tests yielding the largest number of artifacts were located approximately 10 m east of the terrace edge and 10-20 m north of the construction corridor centerline (Figure 11). These two tests exhibited similar soil profiles and vertical artifact-distribution patterns. Three soil strata were distinguished in the profile of each test: Stratum 1 appeared to be a culturally sterile, flood-deposited layer consisting of a loose, black 10YR2/1 sandy silt loam that extended to a depth of approximately 25 cm BS; Stratum 2, which was distinguished following a sharp, well-defined break in soil color, consisted of a compact, very dark gray 10YR3/1 sandy silt that extended from a depth of approximately 25 cm BS to 52 cm BS; and, Stratum 3 appeared to be a culturally sterile subsoil consisting of a very compact, medium brown 10YR4/3 sandy, clayey silt mixed with very dark grayish brown 10YR3/1 silt that extended from a depth of approximately 52 cm BS to the base of the shovel tests (60-65 cm BS). All of the artifacts recovered in these two shovel tests, including eight Black Sand/Liverpool series sherds, were found in Stratum 2, suggesting this deposit represented an intact midden associated with Early Woodland occupations; during the subsequent Phase III investigation, however, it was determined that the cultural deposit present at the site does not represent a true midden. It was estimated that the intact deposit might cover an area no larger than 200 m^2 within the project area.

The geomorphological investigation conducted at the Persimmon site consisted of soil coring. Three sampling tube cores were advanced and described at three locations along the construction corridor centerline, one on the terrace at the eastern edge of the site, one approximately halfway down the terrace escarpment, and one near the Swan Lake shoreline at the western edge of the site. Soil profile development and the presence of basal late glacial red silts indicated the terrace dates to the early Holocene. The portion of the terrace located farthest from the Swan Lake shoreline appeared relatively undisturbed, but late Holocene and historical erosion

have affected the surfaces downslope. Soils observed in the core advanced nearest the shoreline suggest this portion of the site has sustained the most historical erosion.

A total of 256 artifacts was recovered at the Persimmon site during the 1994 survey, including 164 from the Swan Lake and Illinois River shorelines and 91 from shovel tests. Approximately 75% of the artifacts in the shoreline collection were found inside the project area. The site collection included 77 ceramic sherds and 176 lithic artifacts. Ceramics diagnostic of Early and Late Woodland period occupations were recovered in the project area. The Early Woodland ceramics consisted of Black Sand culture ceramics, including both Cypress phase and Liverpool series sherds, and the Late Woodland ceramics consisted of Bluff phase ceramics, including both Early Bluff and Late Bluff sherds. All of the Early Woodland ceramics, and two Late Woodland Type Indeterminate sherds, were recovered in shovel tests excavated on the terrace and terrace escarpment. Five of the 20 Late Woodland sherds found on the Persimmon site shoreline, including 3 Early Bluff sherds, 1 Late Bluff sherd, and 1 Late Woodland Type Indeterminate sherd, were found inside the project area, and the remainder were found outside the project area.

No Bluff ceramics were recovered during the Phase III investigation at the Persimmon site, indicating that the source of the Bluff sherds recovered during the Phase I investigation is located outside the excavated portion of the site.

The temporally diagnostic projectile points/hafted knives recovered at the site include one Early Woodland Waubesa (Mason) point and two Early Woodland Dickson Contracting Stemmed points. The Waubesa point was recovered from a shovel test excavated on the terrace edge, 50 m east and 10 m south of the northwestern corner of the shovel test grid (Figure 11). Both of the Dickson points were found on the Swan Lake shoreline, one approximately 20 m north, and the other approximately 40 m southwest, of the northwestern corner of the shovel test grid (Figure 11).

On the basis of its large size, and high artifact density and diversity, the Persimmon site was interpreted as having functioned as a base camp during some part of its occupational history. The portion of the site located inside the project area appeared to contain an intact midden remnant associated with Early Woodland, and possibly Late Woodland, occupations, and it was suspected that features associated with these components might be present as well. The temporally diagnostic artifacts recovered from the intact cultural deposit consisted predominately of Early Woodland Black Sand culture ceramics, indicating that the major occupation within the investigated portion of the site dated to this period. A shovel test excavated on the terrace, immediately north of the tests in which the intact cultural deposit was identified (Figure 11), yielded two Late Woodland Type Indeterminate sherds, suggesting that this component, though possibly associated with the intact midden remnant, nonetheless represented a minor occupation at the site. The results of the 1994 survey suggested that the intact cultural deposit present within the threatened portion of the Persimmon site might be restricted to a relatively small area. No evidence of the Middle Woodland

component identified at the Persimmon site during the initial site survey (Farnsworth 1976) was recovered in the course of the 1994 survey.

The Persimmon site was evaluated as eligible for inclusion on the National Register of Historic Places (NRHP). It was recommended that if the site could not be avoided the adverse effects of proposed construction be mitigated through conducting a Phase III investigation involving limited hand excavations, extensive mechanical stripping, and a detailed geomorphological investigation of the portion of the site located inside the project area (Titus et al 1995).

At a meeting with the St. Louis District and American Resources Group held on November 14, 1995, the Illinois Historic Preservation Agency concurred with the foregoing NRHP eligibility determination for the Persimmon site. In a letter to the St. Louis District dated February 9, 1995 (Appendix D), the State Historic Preservation Officer concurred with the recommendation that the anticipated adverse effects on the Persimmon site of the proposed construction be mitigated through conducting a Phase III investigation involving limited hand excavations, extensive mechanical stripping, and a detailed geomorphological investigation of the portion of the site located inside the Pump Station #3 project area.

Present Investigation

In accordance with the Scope of Work for this project, Phase III data recovery efforts focused on the portion of the Pump Station #3 construction area that had yielded positive shovel testing results during the Phase I survey. Fifty hand-dug test units, totaling 31.5 m^2 of surface area, were excavated across the site, an area of approximately 1,025 m^2 was mechanically stripped along the terrace edge and upper terrace escarpment, and all subsurface features identified at the site (n=3) were excavated.

Test Unit Excavation

The Phase I shovel testing results indicated that the intact cultural deposits present within the investigated portion of the Persimmon site were restricted to the terrace and the upper portion of the terrace escarpment, the artifacts occurring on the lower portions of the terrace escarpment and the Swan Lake shoreline apparently having been redeposited there as the terrace has eroded. The initial objective of the present investigation was to reassess the distribution of intact cultural deposits identified during the survey using data obtained through the excavation of systematically placed test units.

Thirty-eight .5 m x .5 m test units were excavated on the 10 m grid that had been established across the project area (Figure 12). The 28 test units placed along the W30, W40, and W50 grid lines lay on the terrace escarpment, while the 10 units placed along the W0, W10, and

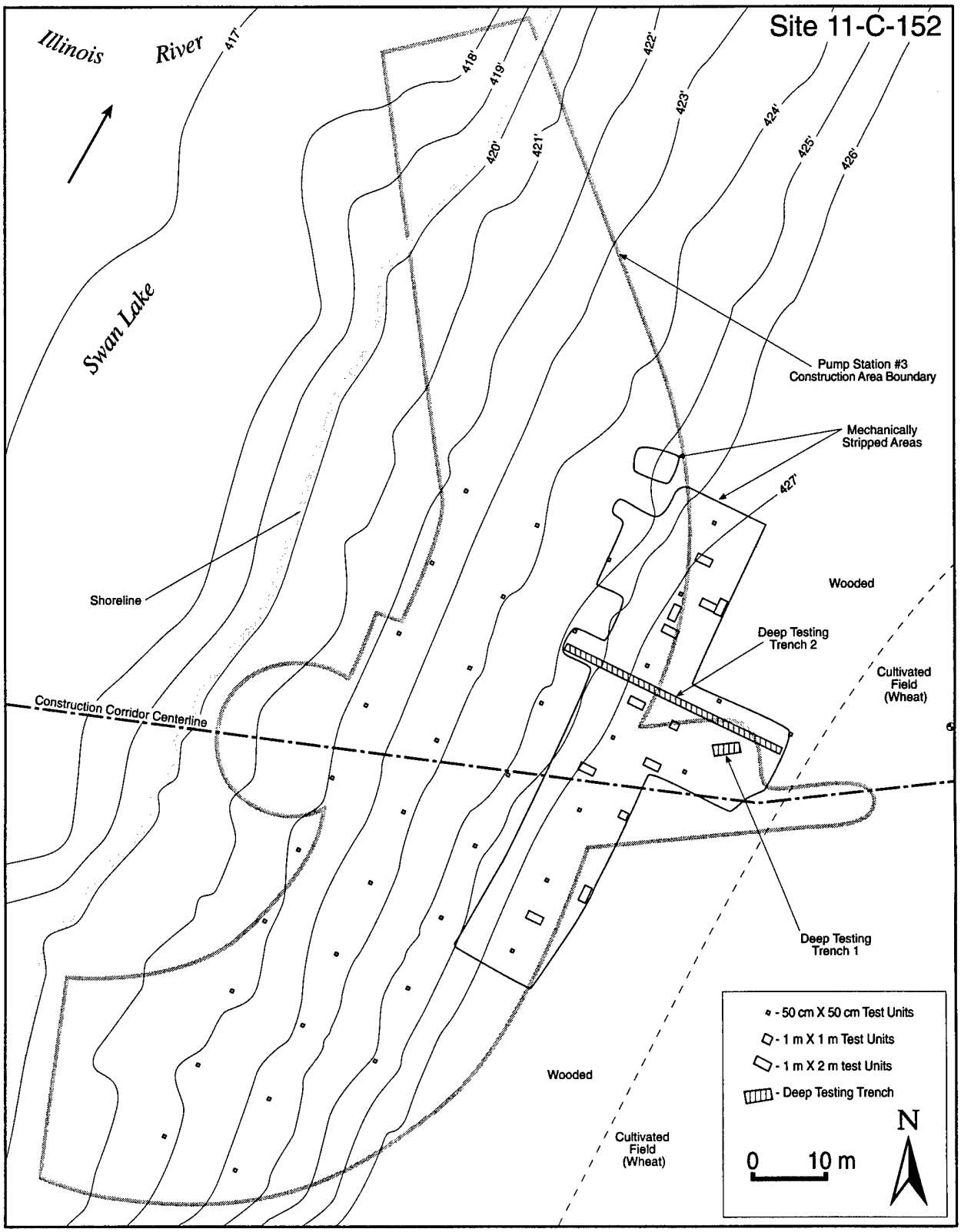


Figure 12. Location of test units, deep testing trenches, and mechanically stripped areas, site 11-C-152, Pump Station #3 construction area, Swan Lake HREP.

W20 grid lines were located on the terrace (Figures 12 and 13). Each of the .5 m x .5 m test units was excavated by hand following the procedures outlined in Chapter II.

The results of the .5 m x .5 m test excavations confirmed that the intact cultural deposits present in the project area are restricted to the terrace. As expected, artifact frequency was considerably higher in the test units excavated on the terrace than in those excavated on the terrace escarpment. Moreover, artifacts recovered in the test units placed on the terrace escarpment were primarily restricted to the relatively recent flood deposit capping the site, while artifact frequency in the units excavated on the terrace increased dramatically below this surface deposit (Figure 14). The soil and artifact-frequency profiles identified in these units indicate that the portion of the site located within the project area is capped by a 10-30-cm-thick alluvium deposit that is underlain by culturally sterile deposits on the terrace escarpment and by intact cultural deposits on the terrace. The cultural material contained in the alluvium deposit capping the terrace is inferred to have eroded from the portion of the cultural deposit exposed on the upper terrace escarpment, only to be redeposited on the terrace during subsequent flooding episodes.

The .5 m x .5 m test excavations also provided some information on the areal extent of the intact cultural deposits present on the terrace. It appears that these deposits are contained within the natural levee deposit running along the edge of the terrace, and, consequently, are confined to a relatively narrow band along the terrace margin. Artifact frequency in the units excavated along the W20 grid line, which traverses the length of the levee deposit, was more than four times higher than in those excavated along the W10 grid line, and the single test unit excavated on the W0 grid line was culturally sterile (Figure 13).

Following the completion of the .5 m x .5 m test units, 10 1 m x 2 m test units were excavated on the terrace in order further to define the horizontal and vertical limits of the intact deposits identified in this area, and to obtain a larger sample of the site contents. Test Units 1-8 were systematically placed along the W20 and W15 grid lines, and Test Units 9 and 10 were placed in areas that previous test unit excavations indicated might contain large numbers of ceramics (Figure 13). Each of the 1 m x 2 m test units was excavated by hand following the procedures outlined in Chapter II.

Intact cultural deposits were identified in each of the 1 m x 2 m test units, but artifact density varied considerably across the investigated portion of the terrace. To begin with, artifact density was higher in the test units placed on the sandy levee deposits lining the terrace margin (W20) than in those located along the eastern edge of the project area (W15)(Figure 13). This pattern is consistent with the artifact-frequency distribution data obtained from the .5 m x .5 m test excavations, as well as with the geomorphological data indicating the thickness of the levee deposit declines steadily, and fairly rapidly, from the terrace margin eastward. Artifact density in the test units excavated along the levee-capped terrace margin (W20) also reflected a considerable degree of variation. In general, artifact density was higher in those 1 m x 2 m units located near the center of the investigated portion of the terrace margin (W20 S5 - W20 N15) than at either the southern or northern ends (Figure 13). The central portion of the area of highest artifact density lies

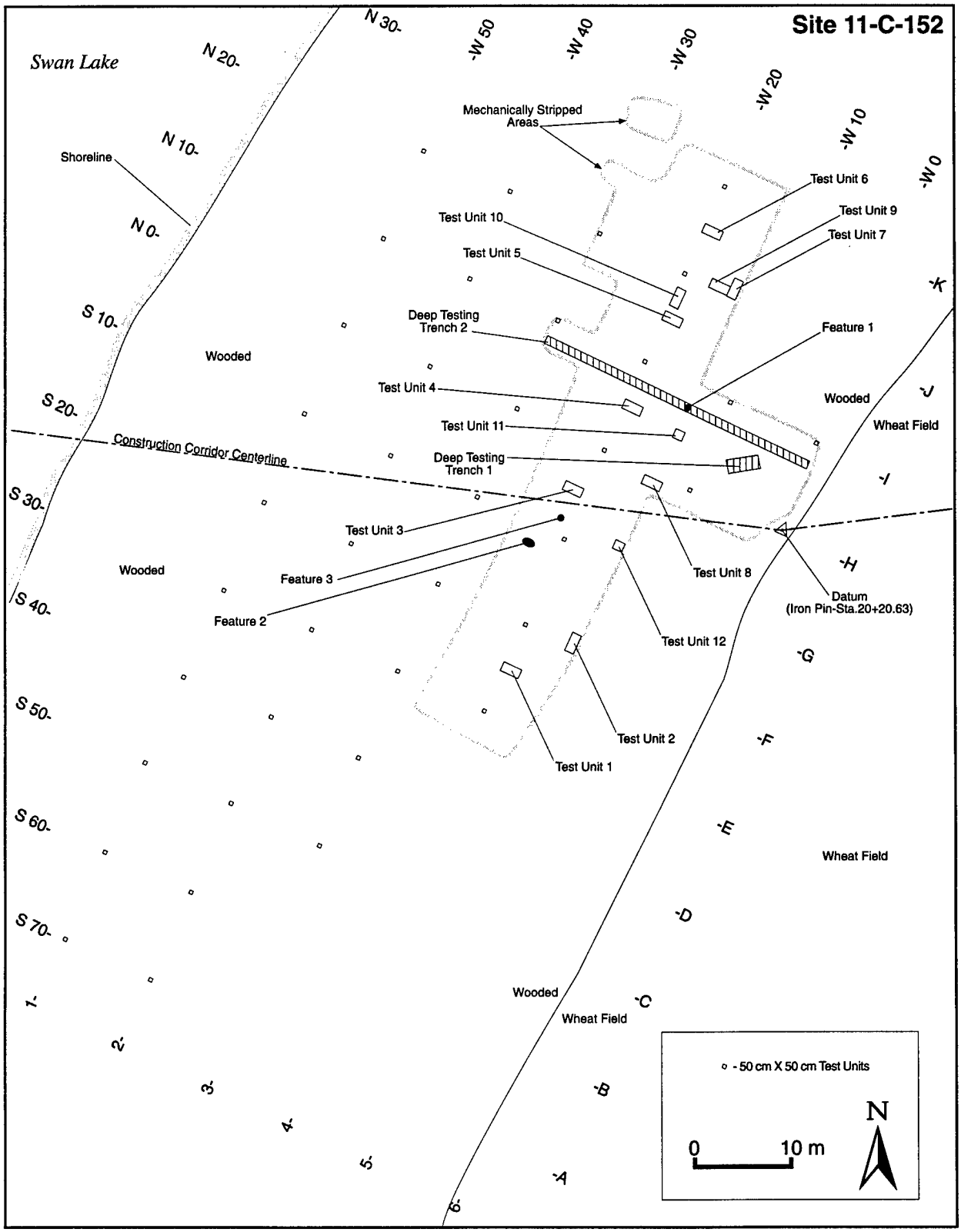


Figure 13. Detailed map showing the locations of features, test units, deep testing trenches, and mechanically stripped areas, site 11-C-152, Pump Station #3, Swan Lake HREP.

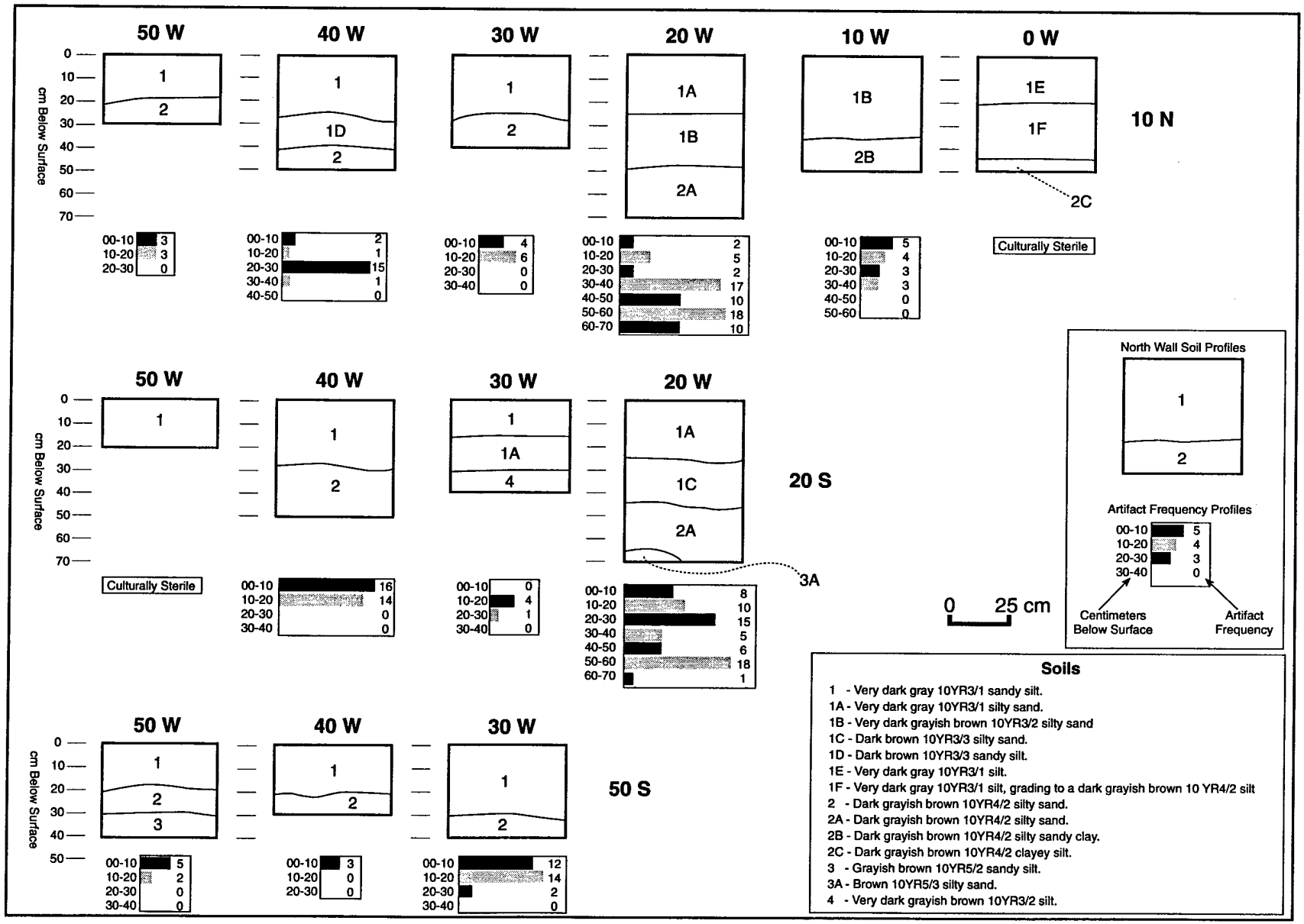


Figure 14. Arifact frequency and wall profiles of selected .5 m x .5 m test units, site 11-C-152, Pump Station #3, Swan Lake HREP.

approximately 5 m west of the area containing the intact cultural deposit identified during the Phase I survey (Figures 11 and 13).

Cultural material was found to extend from the ground surface to a depth of 60-80 cm (BS) in each of the 1 m x 2 m test units, but there was a marked decline in artifact density and artifact size below a depth of 50 cm BS in most of the units. Artifact density was highest within the third, fourth, and fifth 10 cm levels in most of the units, indicating that the major occupational zone within this portion of the site lies 20-50 cm below the modern ground surface (Figure 15). Although a large sample of artifacts was recovered during test unit excavation, no evidence of features was observed in any of the units.

Four natural strata were distinguished in the soil profiles of most of the 1 m x 2 m test units (Figure 15). Stratum 1 appears to represent a post-occupational alluvium deposit containing redeposited artifacts, Stratum 2 and Stratum 3 correspond to the major occupational zone at the site, and Stratum 4 appears to represent culturally sterile sediments containing a small number of artifacts translocated downward from the overlying cultural deposit by natural processes. Stratum 1 corresponds to the surface A horizon identified during the geomorphological investigation, Stratum 2 and Stratum 3 correspond to a buried A horizon, and Stratum 4 corresponds to the underlying B horizon (Figure 9). The overwhelming majority of the temporally diagnostic artifacts recovered from Stratum 2 and Stratum 3 consist of Black Sand culture ceramics, indicating that this occupational zone dates primarily to the Early Woodland period.

A deeply buried soil horizon (AB_{tb} or B_{tb}) identified on the terrace during the geomorphological investigation occurs at depths ranging from about 1 m BS to 1.4 m BS (Figure 9). Two 1 m x 1 m test units, Test Units 11 and 12, were excavated in the buried surface during the mechanical excavations (described below) in order to determine whether it contains cultural material (Figure 13). Working from stripped surfaces, three 10 cm levels were excavated in each unit; all excavated soil was screened through 1/4 in. mesh. Test Unit 11 was excavated from an initial depth of 1 m BS to a depth of 1.3 m BS, and Test Unit 12 from an initial depth of .9 m BS to 1.2 m BS. Each of these units yielded a single Burlington flake, both at a depth of 1-1.1 m. While these results indicate this buried horizon contains a minor prehistoric occupation, it appears that only the extreme western end of the surface, perhaps from W21 - W27, will be impacted by the proposed construction activities (Figures 9, 10, and 13).

Mechanical Excavation

After completing the excavation units, an area totaling approximately 1,025 m^2 was mechanically stripped along the terrace and upper terrace escarpment within the project area and vicinity (Figures 12 and 13). Except for two areas containing large trees, the entire terrace and the adjacent escarpment within the project area were stripped. One of the two areas that could not be stripped is a triangular-shaped area located in the proposed parking area immediately east of Test Unit 12 (Figures 12 and 13), and the other is a triangular-shaped section of the terrace margin between S60 and S32. A fairly large portion of the terrace margin immediately east of the project

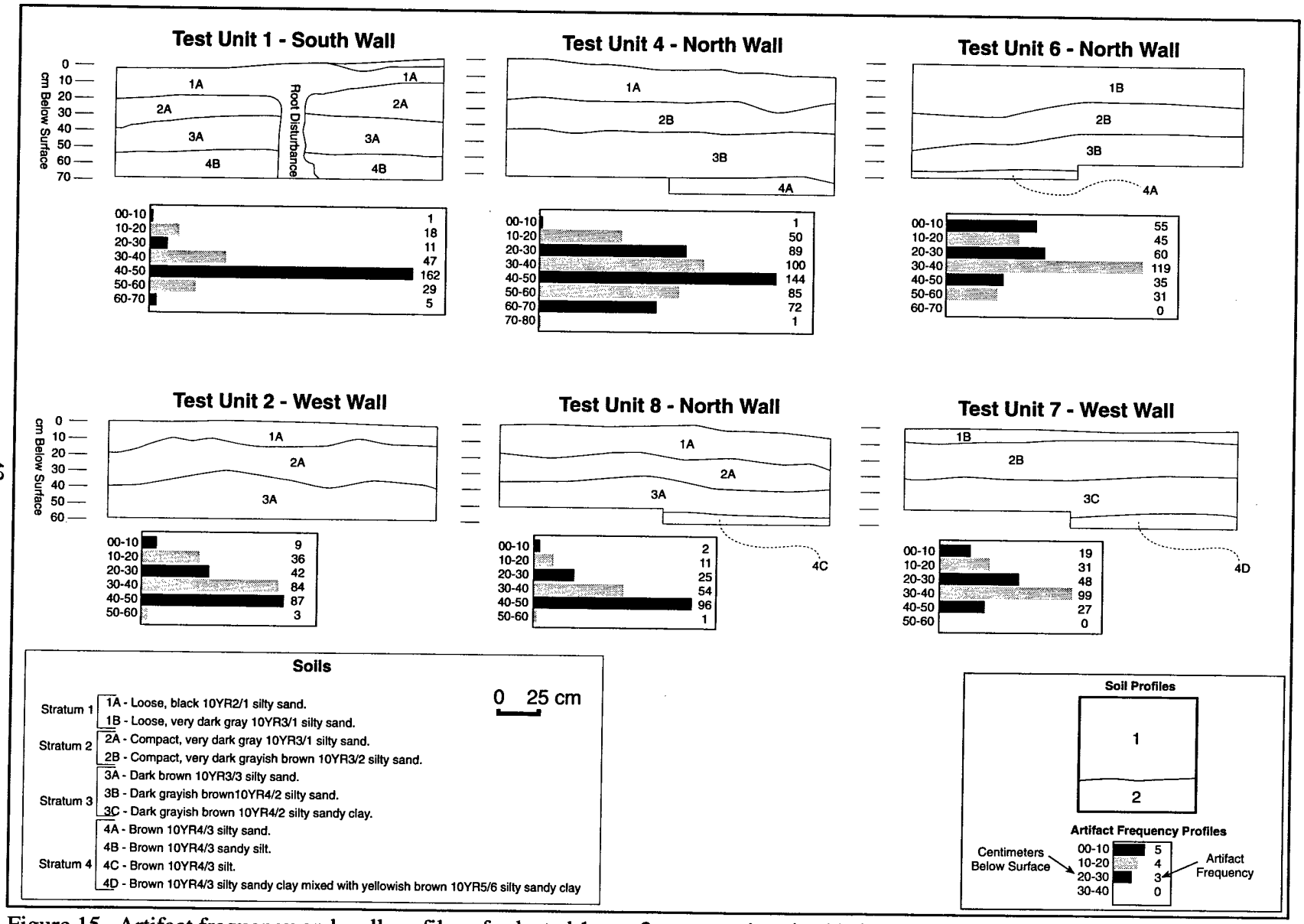


Figure 15. Artifact frequency and wall profiles of selected 1 m x 2 m test units, site 11-C-152, Pump Station #3, Swan Lake HREP.

area (N2 - N32), including most of the area surrounding the shovel tests in which the intact cultural deposit was identified during survey, was also stripped (Figures 11, 12, and 13).

A small amount of cultural material was observed throughout the cultural deposit during the stripping operation. Artifact density appeared to be slightly higher in the area south of Deep Testing Trench 2 (South Stripping Block), than elsewhere, although the larger number of artifacts collected in this area is no doubt due in part to its larger size, as well as to the fact that a less stringent collection strategy was used in this area than in the area north of Trench 2 (North Stripping Block)(Figure 13). In any event, a larger number of lithic tools and ceramic sherds was collected in the South Block than in the North Block or the East/West Stripping Trench (Deep Testing Trench 2). Among the artifacts collected in the South Block during stripping was an Early Woodland Belknap point, which is the only temporally diagnostic point found during this investigation.

Three of the soil stains identified during stripping were subsequently interpreted as prehistoric pit features. Each pit feature was assigned a feature number, and its location was plotted on the site map using tapes pulled from site grid stakes. The features identified during stripping are contained within a 200 m^2 area on the terrace margin near the center of the investigated portion of the site (Figure 13). The area containing the three features overlaps to a considerable extent with both the area of highest artifact density defined during 1 m x 2 m test unit excavation and the area in which the intact cultural deposit was identified during the Phase I survey.

No other distinct artifact concentrations, postholes, structures, middens, or burials were identified during this investigation.

Feature Descriptions

Three prehistoric pit features, Features 1-3, were identified at the Persimmon site, all during the stripping operation (Figure 13). Pit features are pits that were constructed in association with prehistoric activities such as food storage, cooking, and refuse disposal. Each of the features was excavated by hand following the procedures outlined in Chapter II. Feature descriptions are presented below.

Feature 1. Feature 1 was located approximately 6 m east of the terrace margin, at N8 W13.8 (Figure 13). The feature was identified at the base of the East/West Stripping Trench, 49 cm below the ground surface, but it appears to have originated at some point above the depth at which it was recognized. Feature limits were defined on the basis of differences in soil color within and without the feature (Figures 16 and 17a).

Feature 1 is a shallow basin that is characterized by gradually insloping walls without a distinct break between the sides and the bottom (Figures 16 and 17b). The pit is approximately 85 cm in diameter and has a defined depth of 23 cm. Feature fill consisted of a single fill zone of very

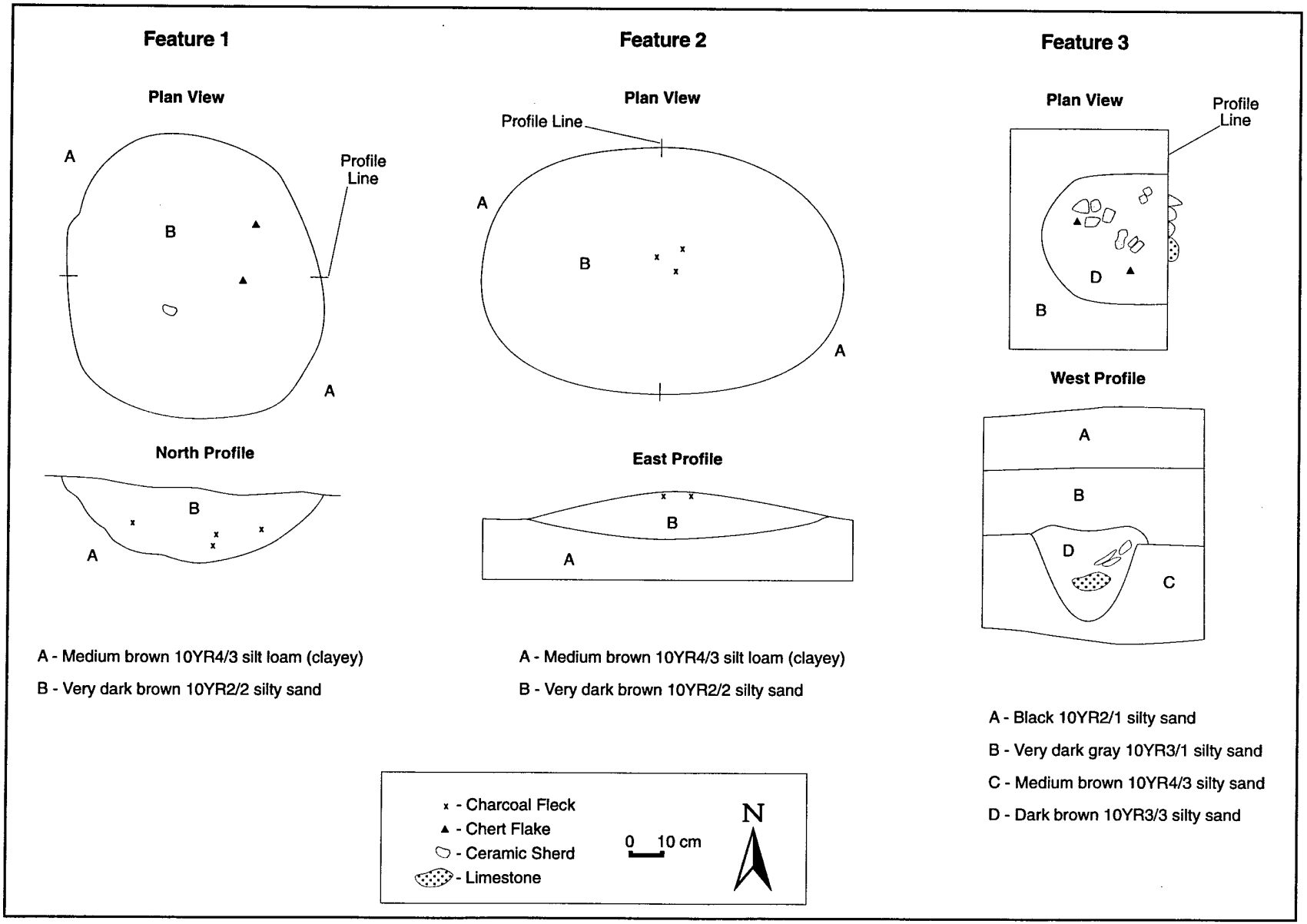


Figure 16. Plan views and profiles of pit features, site 11-C-152.

Figure 17a. Feature 1, plan view, site 11-C-152.

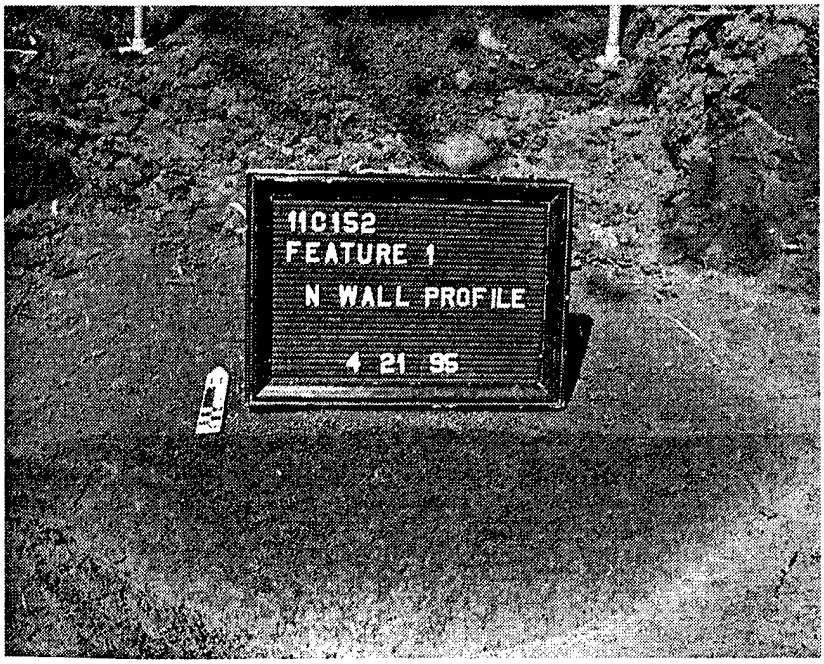


Figure 17b. Feature 1, north profile, site 11-C-152.

dark brown 10YR2/2 silty sand. The contents of the feature present no evidence of *in situ* burning, such as oxidized soils or large amounts of charcoal and ash, or of indirect heating, such as cracked or burned rocks. A total of 54 artifacts was recovered from the screened fill, including 1 nondiagnostic point fragment, 9 pottery sherds, and 44 debitage flakes. Three of the sherds found in the feature are classifiable as Black Sand Liverpool series ceramics, including two Liverpool variety Cypress sherds and one Liverpool variety Schultze sherd, indicating Feature 1 dates to the Early Woodland period. A bulk soil sample taken from Feature 1 has returned an uncorrected radiocarbon determination of 1570 +/- 60 B.P. (Beta-82039), which is clearly an unacceptable date. The calibrated age of sample number Beta-82039 (A.D. 390 to 630) is also several centuries too recent for the Black Sand Cypress and Schultze phase components (550 B.C. - 230 B.C.) represented in Feature 1.

The specialized studies of the faunal and botanical remains derived from the flotation of a 10 liter soil sample from Feature 1 are reported in Chapters VII and VIII, respectively. These studies indicate that this feature contained small amounts of mammal and fish bone, as well as several nutshell fragments.

Feature 1 may have been used for cooking or heating, but the contents of its fill do not provide clear evidence of its function.

Feature 2. Feature 2 was located on the terrace margin approximately 18-22 m southwest of Feature 1, at S11.6 W23 (Figure 13). The feature was identified at the base of a stripped area, 55 cm below ground surface, but it appears to have originated at some point above the depth at which it was recognized. Feature limits were defined on the basis of differences in soil color within and without the feature (Figures 16 and 18a).

Feature 2 is a shallow basin that is characterized by gradually insloping walls without a distinct break between the sides and the bottom (Figures 16 and 18b). The pit is approximately 118 cm long, 80 cm wide, and has a defined depth of 15 cm. Feature fill consisted of a single fill zone of very dark brown 10YR2/2 silty sand, and presents no evidence of *in situ* burning or indirect heating. One artifact, a Burlington chert flake, was recovered from the screened fill. Feature 2 cannot be assigned to a cultural period.

The specialized studies of the faunal and botanical remains derived from the flotation of a 10 liter soil sample from Feature 2 are reported in Chapters VII and VIII, respectively. These studies indicate that this feature contained small amounts of wood charcoal and calcined bone, but no identifiable subsistence remains.

Feature 2 may have been used for cooking or heating, but its contents provide little evidence of function.

Feature 3. Feature 3 was located on the terrace margin approximately 4 m southwest of Feature 2, at S7.8 W21 (Figure 13). The feature was initially identified in the wall of a stripping

Figure 18a. Feature 2, plan view, site 11-C-152.

Figure 18b. Feature 2, east profile, site 11-C-152.

trench, at a depth of 42 cm BS. The west end of Feature 3 was recorded at its point of origin. Feature 3 was defined on the basis of differences in soil color and cultural material density within and without the feature (Figures 16 and 19a).

Feature 3 is characterized by insloping walls and a rounded bottom (Figures 16 and 19b). Although its walls are steeper than those of Features 1 and 2, and it is slightly deeper than those features, Feature 3 is classified as a shallow basin. An undetermined portion of the east end of the pit was removed by mechanical stripping before the feature was recognized. The recorded portion of Feature 3 is oval in plan view, and is approximately 40 cm long, 40 cm wide, and 28 cm deep. If the original length/ width ratio of the feature was similar to that of Feature 2 (1.5:1), Feature 3 would have been approximately 60 cm long when constructed. Feature fill consisted of a single fill zone of dark brown 10YR3/3 silty sand, and presents no evidence of *in situ* burning. However, the feature did contain a small fragment of fire-cracked limestone and a large, burned piece of limestone that may have been used indirectly to heat the pit.

Feature 3 contained a total of 142 artifacts, including 1 formal flake tool (perforator/drill), 97 pottery sherds, 42 debitage flakes, and 2 pieces of limestone. The classifiable sherds found in Feature 3 include both Black Sand Liverpool series ceramics and early Havana series ceramics, suggesting the pit may date to the Early Woodland/Middle Woodland transitional period (200 B.C.- 50 B.C.). The Liverpool series ceramics from this feature include Cypress and Schultze variety sherds. A wood-charcoal sample obtained from flotation materials from Feature 3 returned an unacceptable radiocarbon determination of 130 +/- 50 B.P. (Beta-82288).

The analyses of the faunal remains derived from the flotation of a 10 liter soil sample from Feature 3 (Chapter VII) indicates this feature contained small amounts of burned and calcined mammal and fish bone, wood charcoal and calcined bone, but no identifiable subsistence remains. No prehistoric floral remains were identified among the flotation materials (Chapter VIII).

It is possible Feature 3 represents a cooking or heating facility, but this cannot be determined on the basis of its contents.

Site Structure and Stratigraphy

A major objective of the present investigation was to obtain a clearer understanding of the occupational history of the Persimmon site through an examination of its natural and cultural stratigraphy. The results of the Phase I survey had been sufficiently detailed to provide an initial characterization of the site, but had raised a number of important questions concerning its structure. It was hoped that the data obtained during the present investigation could be used to answer those questions.

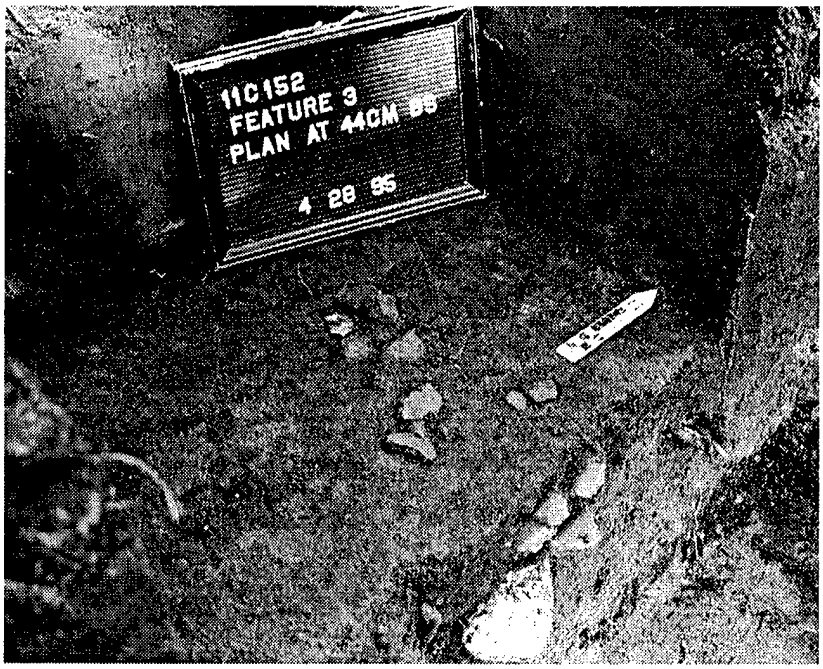


Figure 19a. Feature 3, plan view, site 11-C-152.

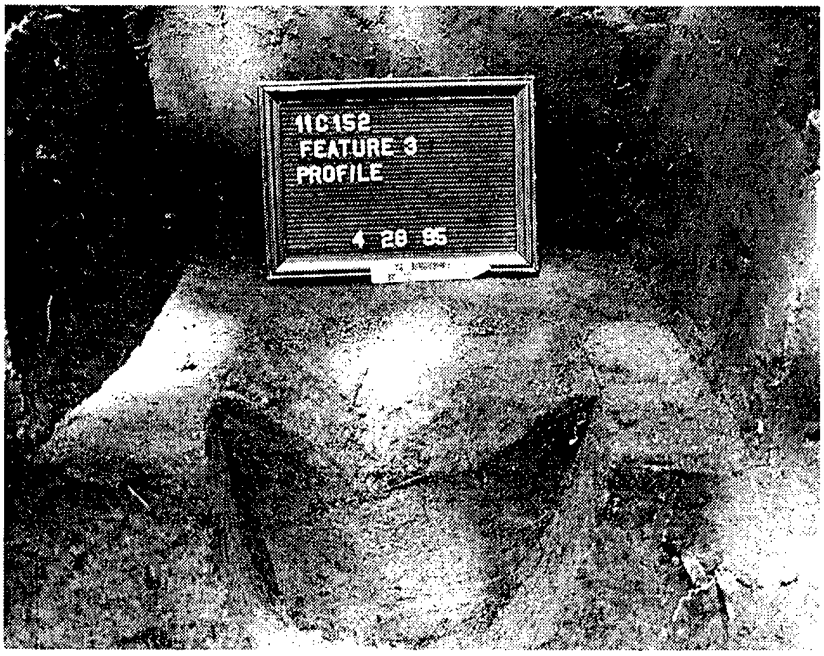


Figure 19b. Feature 3, west profile, site 11-C-152.

The intact cultural deposit identified at the Persimmon site during the survey was interpreted as a possible midden remnant associated with occupations dating to the Early Woodland and Late Woodland periods. The site appeared to have been occupied much more intensively during the Early Woodland than during subsequent periods, but the precise number, nature, and spatial arrangement of the components that were present were not known. The survey data also suggested that the erosive effects of frequent flooding had removed an undetermined, but perhaps sizable, portion of the terrace and the site formerly occupying it, restricting the intact deposits within the project area to a relatively small area along the terrace margin. The horizontal and vertical limits of those deposits, however, remained poorly defined at the conclusion of the survey.

The purpose of the geomorphological study conducted during this investigation was to document the depositional history of the Persimmon site, and determine the nature and extent of post-occupational impacts on cultural deposits at the site. Stratigraphic information obtained from sampling tube cores and backhoe trenches was used to develop two geologic cross sections of the terrace that have proved helpful in interpreting the results of the archaeological excavations (Figures 8 and 9). The results of the geomorphological investigation are reviewed below.

The Persimmon site is contained within Illinois River levee deposits that cap the margin of a Mississippi River terrace of Holocene age (Figure 8). Approximately 2,500-3,000 years ago, the Illinois River began eroding laterally into the terrace, while, at the same time, creating a natural levee some distance away from the channel margin (Figures 8 and 9). The Persimmon site was first occupied by Early Woodland groups sometime after the natural levee had begun forming, and was periodically reoccupied as the levee deposits continued to aggrade. The Illinois River continued laterally to erode eastward into the terrace and, eventually, the occupational surface during the latter part of the Early Woodland period, while adding levee deposits to the surface some distance back of the terrace margin. Consequently, the occupational surfaces away from the channel margin were repeatedly buried by levee deposits, while the deposits closer to the channel margin were eroded (Figure 9).

The alluvium deposit capping the project area contains a surface A horizon and a buried A-B horizon sequence (Figure 9). The buried A horizon consists of Illinois River levee deposits that appear to have accumulated along the terrace margin between approximately 3000 B.P. and 2000 B.P. The intact cultural deposit identified in test units excavated on the terrace appears to be contained entirely within this buried A horizon, although it is primarily confined to the upper portion of this soil unit. Rather than representing a true midden, i.e., a culturally developed soil, it now appears that the cultural deposit present in the project area represents multiple occupational surfaces buried by the vertical accretion of levee deposits. Judging from the extent of soil profile development observed in the levee deposits, the portion of the terrace occupied by the Persimmon site appears to have experienced a long period of stability after about 2000 B.P. The surficial deposit capping the culture-bearing levee deposit appears to have accumulated during the last 1,000 years or so.

The levee deposit extends from approximately W5 to W37, although the upper 30-40 cm of the deposit has been removed by erosion west of W25 (Figure 13). The artifact-frequency profiles of the test units excavated on the terrace indicate the major occupational zone within this portion of the site is contained within the upper 30 cm of the levee deposit (20-50 cm BS), suggesting that the cultural deposits present on the terrace may have extended west of W25 at one time, but have been removed by erosion. Unfortunately, the question of what portion of the original site has been destroyed by erosion remains unanswered.

The levee deposit is thickest along the terrace margin (W20), where it extends from an average depth of about 20 cm BS to an average depth of approximately 80 cm BS (Figure 9). The deposit becomes progressively thinner east of W20, pinching out at approximately W5. This suggests that the intact cultural deposit present within the investigated portion of the site is no more than 20 m wide (W5 - W25), an estimate that is consistent with the horizontal and vertical artifact-distribution pattern identified through excavation.

Test unit excavations indicate that cultural material is distributed in a narrow, linear zone along the terrace margin across the project area. An area of higher artifact density was identified within this zone that is located near the center of the investigated portion of the terrace margin (W20 S5 - W20 N15) (Figure 13). As was previously mentioned, this area of high artifact density overlaps to a considerable extent with both the area containing the three features identified during this investigation and the area in which the intact cultural deposit was identified during the Phase I survey.

Ceramics diagnostic of Early, Middle, and Late Woodland period occupations were recovered during excavations at the Persimmon site. The composition of the ceramic collection indicates the major occupation at the site dates to the Early Woodland period, and suggests the intact cultural deposit present in this part of the site is primarily associated with this component. The results of the detailed ceramic analysis are presented in Chapter V. The horizontal and vertical distribution patterns of diagnostic sherds are briefly examined here in order to determine the extent to which the deposits associated with the minor Middle and Late Woodland occupations are mixed with those dating to the Early Woodland.

A total of 320 classifiable sherds was recovered from the 20 test units excavated on the terrace during this investigation. Most of these sherds were recovered from the intact cultural deposit present in this portion of the site, although 30-40 of the sherds were found in the post-occupational alluvium deposit capping the project area. Of the 320 classifiable sherds recovered in these test units, 295 (92.2%) are identified as Early Woodland sherds, 16 (5%) are Middle Woodland sherds, and 9 (2.8%) are Late Woodland sherds. A total of 34 classifiable sherds also was recovered from two of the features excavated at the site, including three Early Woodland sherds from Feature 1, and 14 Early Woodland sherds and 17 Middle Woodland sherds from Feature 3. All of the classifiable sherds recovered in the .5 m x .5 m test units excavated on the terrace escarpment are Early Woodland sherds that appear to have been redeposited downslope as the terrace has eroded.

The horizontal distribution of Middle Woodland ceramics suggests that the deposits associated with this component are concentrated in two areas within the investigated portion of the site, one at the north end of the project area and the other on either side of the construction corridor centerline. The Middle Woodland sherds recovered in Test Units 5, 6, 9, and 10 represent the more northern of the two concentrations, and those recovered in Test Unit 3 and Feature 3 represent the other (Figure 13). All of the Late Woodland sherds were recovered in Test Units 6 and 9, suggesting that this component is primarily restricted to the extreme northern end of the project area. Interestingly, fully 75% of the Middle Woodland Havana sherds recovered in the test units were recovered from the two units yielding all of the Late Woodland sherds.

Late Woodland sherds were confined to the first through fifth levels of the units (20-40 cm BS), Middle Woodland sherds were recovered in the first through the sixth levels (0-50 cm BS), and Early Woodland sherds were found in the first through the sixth levels (0-60 cm BS). Early Woodland sherds occur in much greater frequency than Middle or Late Woodland sherds in each of the six levels yielding ceramics. For example, while approximately 89% of the Late Woodland sherds and 44% of the Middle Woodland sherds were recovered in the fourth level (30-40 cm BS), these sherds together account for less than 10% of the classifiable sherds recovered in this level. Moreover, of the 73 classifiable sherds recovered in the fifth and sixth levels (40-60 cm BS), all but one (99%) are Early Woodland sherds.

The accompanying chart maps the vertical distribution of the Middle and Late Woodland sherds found in Test Units 3, 5, 6, 9 and 10 in relation to the four natural strata identified in the profiles of these units (Figure 20). As previously mentioned, Stratum 1 appears to represent a post-occupational alluvium deposit containing redeposited artifacts, Stratum 2 and Stratum 3 contain the major occupational zone at the site, and Stratum 4 appears to represent culturally sterile sediments containing a small number of artifacts translocated downward by natural processes. Because test unit excavation was conducted using arbitrary levels that crosscut natural strata, it is difficult in many instances to specify the soil stratum from which a particular sherd was recovered.

The overwhelming majority (92.4%) of the classifiable sherds recovered from Stratum 2 and Stratum 3 are Early Woodland Black Sand sherds, although 13 (4.5%) Middle Woodland sherds and 9 (3.1%) Late Woodland sherds were recovered from these strata as well. Moreover, while the ceramics associated with each of the three components occur most frequently in Stratum 2, a much larger proportion of the Early Woodland ceramic assemblage occurs in Stratum 3 than is the case with the Middle or Late Woodland assemblages. This pattern, together with the virtual absence of Middle and Late Woodland ceramics below a depth of 40 cm BS, suggests that the lower portion of the major occupational zone appears to be almost exclusively associated with occupations dating to the Early Woodland period.

The vertical distribution of diagnostic ceramics at the Persimmon site indicates the deposits associated with the Early, Middle, and Late Woodland components are to some extent mixed. Evidence of mixing within the intact cultural deposit, however, was recovered from a limited

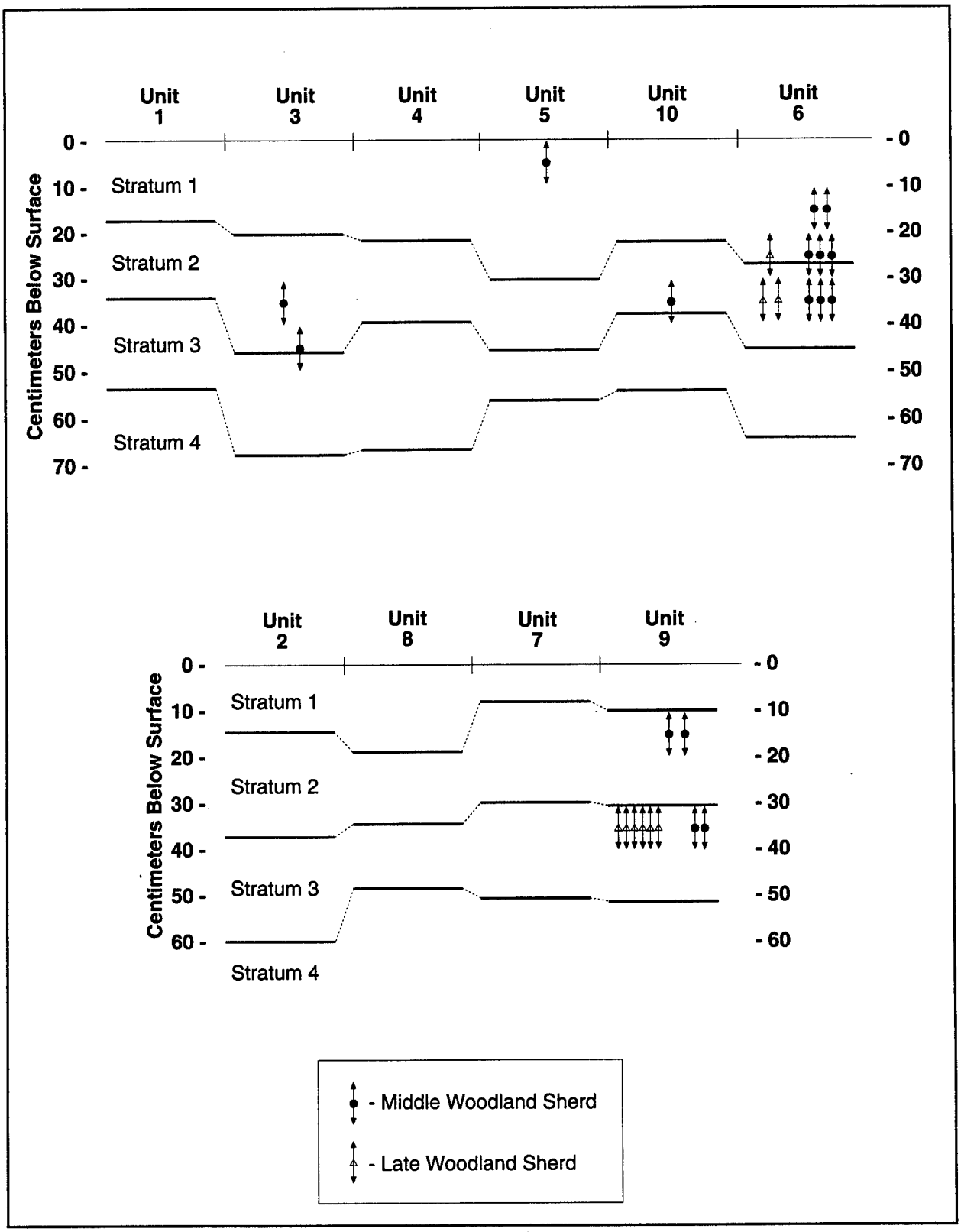


Figure 20. Vertical distribution of Middle and Late Woodland sherds recovered during test unit excavations in relation to natural strata.

number of test units, suggesting that the extent to which the temporally discrete deposits have been mixed is limited as well. Moreover, the relative frequency of Early, Middle, and Late Woodland sherds suggests the intact cultural deposit, taken as a whole, may be regarded as essentially an Early Woodland deposit.

CHAPTER V. CERAMIC ANALYSIS

Wes Neal

Introduction

During the Phase III investigations at the Persimmon site, a total of 697 prehistoric ceramic sherds was recovered. A complete ceramic inventory of the site by test unit and excavation level, feature, and stripping block is presented in Tables 1-3. Sixty-three sherds (9.1%) were recovered from 17 of the thirty-eight 50 cm x 50 cm test units, and 17 (2.4%) were found during the stripping operation. The greatest quantity of sherds (n=617/88.5%) was recovered from the 1 m x 2 m units (n=309/44.3%) and the features (n=308/44.2%) located in proximity to the center of the current project area (Figure 21). The ceramic collection from the 1 m x 2 m units was dispersed through levels 1 through 6, with the greater percentage appearing in levels 3 through 5 (Table 1). Most of these sherds were recovered from levels that were excavated in the intact cultural deposit present along the margin of the terrace occupied by the site. The portion of the terrace investigated is encompassed by the mechanically stripped areas of the site.

Study of the Persimmon site ceramic assemblage has resulted in an important contribution to the general understanding and refinement of prehistoric cultural change in the extreme southern extent of the lower Illinois valley. Many of the previously defined cultural/chronological phases in the lower Illinois River valley, as well as other regions in the Midwest, were developed largely with reference to ceramics. As a result, ceramics have come to be used not only as chronological markers but also as indicators of contact and interaction between different regions. This same framework of ceramic identification of cultural affiliation and associated chronological placement will be employed to interpret in part the ceramics recovered from the Phase III investigations at the Persimmon site. Therefore, the following presents a description of the systems of chronology and ceramic classification used to obtain and interpret the information recovered from the ceramic analysis.

Time-Space Divisions

The term *period* is used in this study to divide the flow of time into time-stratigraphic units that encompass a sequence of cultural entities or phases. Current use of the term *culture* in the lower Illinois valley "[implies] that a very substantial homogeneity existed within the area of a given culture along virtually any dimension of sociocultural variability" (Farnsworth and Asch 1986:330).

Table 1 - Ceramic Inventory By 1x2 m Units & Levels

CULTURE/PHASE / SERIES / TYPE / VARIETY	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10	TOTALS	% OF EACH VARIETY
	LEVELS											
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6		
Black Sand/Cypress												
Liverpool												
Parallel Incised												
Cypress			1							1	2	
Incised Dia. C.Hatched												
Cypress					1						1	
Chevron Incised												
Cypress			1								1	
Incised Pat. Indeter.												
Cypress	1	2 8 1		2 1 1	2 8	1 2	1 2		1 1 5	1 5 1	46	
Fingernail Impressed												
Cypress										4	4	
Corkmarked												
Cypress		1 2	1 1 3	2	1 2 2	3	2	1		1 1	23	
Indeterminate												
Cypress		1 1 1	4 3 6 7	2 5 3 2	3 3 24 3	2 2 2	1 2 2	2 1	3 2 1	11 7	106	
CYPRESS VAR. TOTAL	1	1 1 3 1	2 5 4 16 11	4 7 4 3	1 5 5 35 3	2 1 7 2	2 4 2 2	1 2 1	1 1 8 2 1	1 18 12 1	183	59%
Incised Pat. Indeter.												
Villegas	1				1					2	4	
Cordmarked												
Villegas		1	1					2	1		5	
Indeterminate												
Villegas		1								13	14	
VILLEGAS VAR. TOTAL	1	1 1	1		1			2	1	15	23	7%
Schultze												
Liverpool												
Chevron Incised												
Schultze		2			1		18 9		1 2		33	
Incised Pat. Indeter.												
Schultze			1		1 1		2	1	1		7	
Corkmarked												
Schultze				1				1			2	
Indeterminate Pattern												
Schultze		1 5			1		4 9	1 1	1		23	
SCHULTZE VAR. TOTAL		1 7	1	1	1 2 1		4 29 9	1 1 2	1 1 1 2		65	21%
Havana/Mound House												
Hopewell												
Crosshatched Rim												
Indeterminate						1					1	
Pike-Baehr												
Brushed Surface												
Indeterminate						2 2 3			2 2	1	12	
Indeterminate												
Plain												
Indeterminate			1 1		1						3	
L. W./(Weaver/Wht.Hall)												
Indeterminate												
Cordmarked												
Indeterminate						1 2			6		9	
INDETER. VAR. TOTAL			1 1		1	2 4 5			2 8	1	25	8%
Type Indeterminate	4	1 1			1	3 2			1		13	4%
OVERALL TOTAL	1 5	1 1 3 5 8	2 6 4 18 12	4 7 5 3	3 5 7 37 4	4 8 14 2	2 4 6 29 11	1 3 1 1 4	1 4 3 17 4 1	1 34 12 1	309	

Table 2 - Ceramic Inventory By 50x50 cm Units (Terrace)

CULTURE/PHASE / SERIES / TYPE / VARIETY	0N/10W	10N/10W	0N/20W	10N/20W	20N/20W	10S/20W	20S/20W	30S/20W	10N/30W	30N/20W	TOT.	% VAR.
	LEVELS											
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6		
Black Sand/Cypress												
Liverpool												
Parallel Incised												
Cypress					1						1	
Incised Pat. Indeter.												
Cypress			1			1 1	1		1		5	
Corkmarked Cypress												
Cypress		1									1	
Indeterminate												
Cypress	1	1 1 2	2	1	1		2	1		1	13	
CYPRESS VARIETY												
TOTAL	1	1 2 2	2 1	1	1	1	1 1 2	2	1	1	20	47%
Incised Pat. Indeter.												
Villegas						1					1	
VILLEGAS VARIETY												
TOTAL						1					1	2%
Black Sand/Schultze												
Liverpool												
Indeterminate												
Schultze	1					1			1	1 1	5	
SCHULTZE VARIETY												
TOTAL	1					1			1	1 1	5	12%
Type												
Indeterminate					1	2	3 1	2		1 5 2	17	40%
OVERALL												
TOTALS	1 1	1 2 2	2 1 1	1	1 1	1 1 2 4	3 2 1	2	1 1	1 1 5 2 2	43	

Table 2 (cont.) - Ceramic Inventory By 50x50 cm Units (Escarpment)

CULTURE/PHASE / SERIES / TYPE / VARIETY	20S/30W	30S/30W	50S/30W	0N/40W	10N/40W	20S/40W	10N/50W	TOTALS	% OF EACH VARIETY
	LEVELS								
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6		
Black Sand/Cypress									
Liverpool									
Rectilinear Incised									
Cypress					1			1	
Incised Pat. Indeter.									
Cypress			2	1 1	3			7	
Hemiconical Punctate									
Cypress				1				1	
Corkmarked Cypress									
Cypress					4			4	
Indeterminate									
Cypress	1	1					1	3	
CYPRESS VARIETY									
TOTAL	1	1	2	1 2	8		1	16	80%
Type									
Indeterminate				3		1		4	20%
OVERALL									
TOTALS	1	1	2	4 2	8	1	1	20	

Table 3 - Ceramic Inventory By Feature, Stripping Block, & Flot.

CULTURE *SERIES* *TYPE* *VARIETY*	FEA. #1	FEA. #3	EAST/WEST DEEP TRENCH	SOUTH STRIP. BLOCK	NORTH STRIP. BLOCK	AS.-1 FEA.	AS.-22 FEA.	TOTAL
BLACK SAND/CYPRESS								
LIVERPOOL								
INCISED PAT. INDETERMINATE								
CYPRESS	2			1	1			4
CORDMARKED								
CYPRESS		3						3
INDETERMINATE								
CYPRESS			3					3
CYPRESS VARIETY TOTALS	2	3	3	1	1			10
CORDMARKED								
VILLEGAS					1			1
INDETERMINATE								
VILLEGAS				6				6
VILLEGAS VARIETY TOTALS				6	1			7
BLACK SAND/SCHULTZE								
LIVERPOOL								
INCISED PAT. INDETERMINATE								
SCHULTZE		2						2
CORDMARKED								
SCHULTZE	1	9						10
SCHULTZE VARIETY TOTAL	1	11						12
BLACK SAND/INDETERMINATE								
LIVERPOOL								
HEMICONICAL PUNCTATE								
INDETERMINATE				1				1
INDETERMINATE VARIETY TOTAL				1				1
HAVANA/MOUND HOUSE								
HAVANA								
CORDMARKED								
INDETERMINATE		6		1				7
HAVANA/INDETERMINATE								
HAVANA								
INCISED PARALLEL/OBLIQUE								
INDETERMINATE		2						2
INCISED PAT. INDETERMINATE								
INDETERMINATE		7						7
HAVANA/INDETERMINATE								
INDETERMINATE								
HEMICONICAL PUNCTATE								
INDETERMINATE		2						2
INDETERMINATE VARIETY TOTAL		17		1				18
L.WOOD./WEAVER:WHITEHALL								
INDETERMINATE								
CORKMARKED								
INDETERMINATE				1				1
INDETERMINATE VARIETY TOTAL				1				1
LATE WOODLAND CULTURE TOTAL				1				1
TYPE								
INDETERMINATE	6	66	1	1		3	199	276
OVERALL TOTALS	9	97	4	11	2	3	199	325

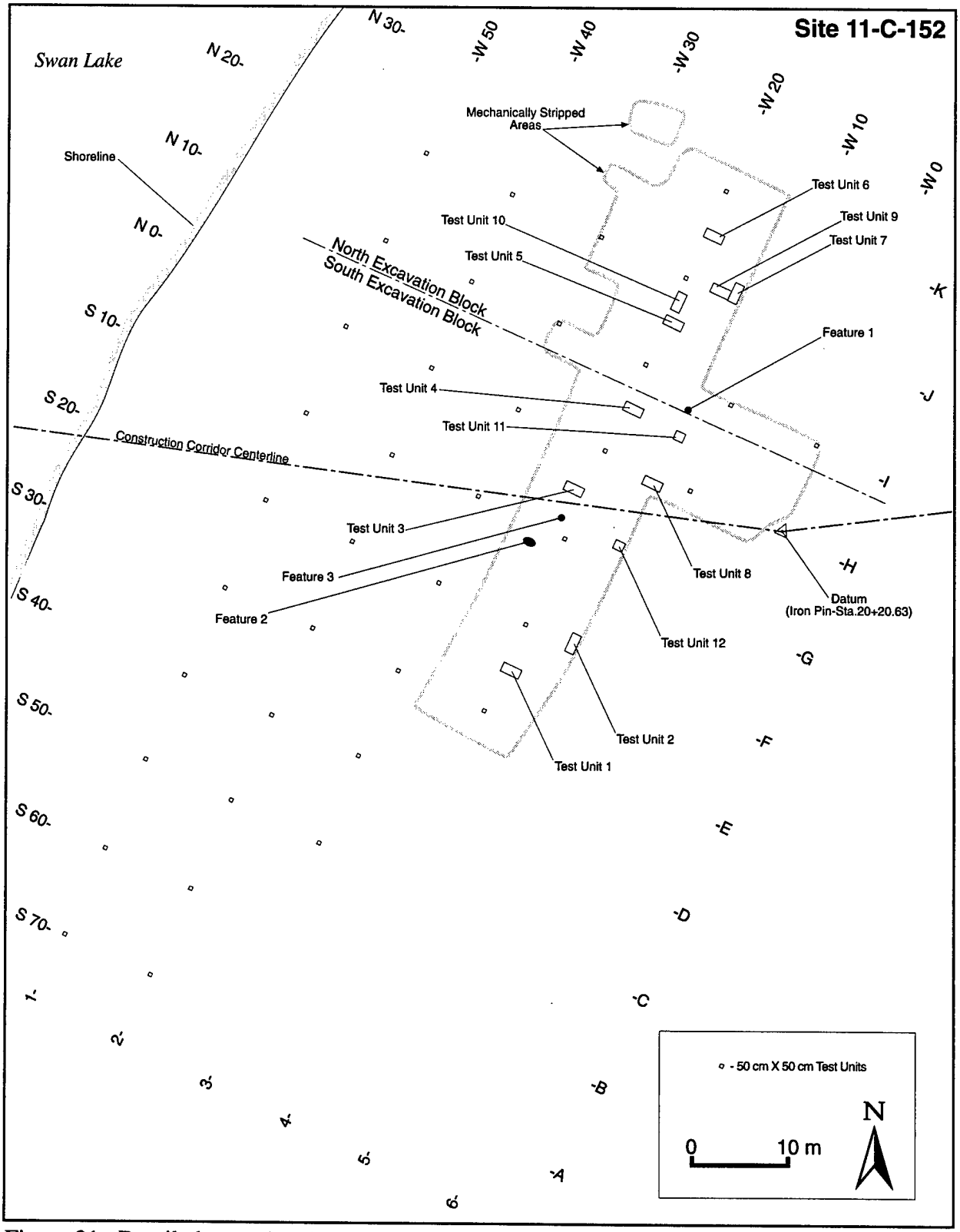


Figure 21. Detailed map showing the locations of features, test units, and mechanically stripped areas, site 11-C-152, Pump Station #3, Swan Lake HREP.

Consequently, the current use of the term *phase* in the region is "to apply it to the minimally recognizable space-time unit" (Farnsworth and Asch 1986:330). Furthermore, separate regional phases are defined "solely on the basis of geographic separation, in the expectation that formal dissimilarities in artifact assemblages and settlement patterns will be recognized as studies progress" (Farnsworth and Asch 1986:330). This study remains consistent with the identification and use of these terms as defined above.

Ceramic Typology

The ceramic identification system used to identify sherds from the current investigation, and to discuss interregional differences in the ceramics of a single culture that includes the decorative and technological variability of ceramics of the lower Illinois valley, is the trinomial form of *type-variety* nomenclature. This system has been used successfully by Farnsworth and Ash (1986) to identify ceramics from the lower Illinois valley, and a similar, but somewhat limited, system was first used by Griffin (1952) to identify ceramics from the central Illinois valley. Kenneth B. Farnsworth examined the ceramics recovered in Features 1 and 3 at the Persimmon site, and identified several of the ceramic types represented in these features.

Ceramic Series. Under the *type-variety* system ceramic *series* are broadly similar over wide areas in recurring general attributes of decoration, vessel form, and paste-temper. However, a difference in tempering material does not necessarily indicate a series-level distinction. Furthermore, while specific decorative types and regional ceramic varieties may often be limited in time and space, a single ceramic series may be shared by contemporary or sequential cultural phases. As is the case in the Illinois valley, as well as other regions of the Midwest and elsewhere, ceramic series are named for an important site or regional landmark where archaeological studies first identified sherds of the series: e.g., Liverpool Parallel Incised.

Ceramic Type. Ceramic *type* refers to categories of decoration or surface treatment on a given sherd. Archaeologists studying the Illinois valley have used this method to trace the extent of regional use of a particular decorative technique by using the same type term for different regional cultural phases occurring throughout the Illinois valley. Because sherds will be used in this study as a typological unit, one apparent decorative type may in reality be a fragment of another named type simply because it may be a very small representation of the overall decorative pattern of any given vessel. Therefore, when multiple possibilities are evident for any given sherd, or when incised sherds are very small, they are placed in a catchall type category: e.g., Incised (pattern indeterminate). Thus, a small incised sherd might be identified as Incised (pattern indeterminate), but may actually be part of a Parallel Incised vessel. When decorative types are not specifically named or could not be positively identified, the default name used in referring to the decoration becomes the name of the ceramic series: e.g., Liverpool (type indeterminate).

Ceramic Variety. Ceramic *variety* identifies regionally manufactured ceramics within a series. Certain varieties are distinguished from other varieties (made locally or in other regions) in their color, paste, and temper. Therefore, a *series* Liverpool *type* Parallel Incised *variety*

Cypress sherd is a fragment of a reddish-brown, chert-tempered vessel made by Early Woodland *period* Black Sand *culture* Cypress cultural *phase* inhabitants of the lower Illinois valley and decorated with Parallel Incised designs. Other specific divisions that can be employed during ceramic analyses that further refine or subdivide the preceding categories include vessel morphology, and the decorative mode and pattern divisions on vessels as well as the sequence of application of individual decorative types to vessels. However, due to the limiting factor that the vast majority of the ceramic collection from the Persimmon site consists of medium to relatively small sized individual sherds, these further refinements were not considered during the current analysis. Instead, the ceramic analysis is confined to period, culture, cultural phase, ceramic series, type, and variety identifications where possible.

Methods of Analysis

Initially, the ceramic analysis was begun by sorting the ceramics into three groups. Group I consisted of decorated sherds. Group II included all undecorated sherds. Group III comprised all plain surfaced or eroded sherds. Next, the sherds contained within Groups I & II were sorted according to paste, color and temper in order to separate the Cypress variety sherds that characteristically have a reddish tint with chert temper. Then diagnostics from Group I were separated into similar decorative types with similar paste colors and tempers.

Temper was classified by examining the edge of any given sherd with a hand lens. Categories of temper include: sand, chert, crushed grit, and clay or grog. A notation was made if the grit temper was unusually finely or coarsely ground, but the mineralogy of specific particles was not identified. A limestone detection procedure was conducted on crushed grit by application of drops of dilute muriatic acid and observing any resulting chemical reaction. The identification of grog vs. clay tempering has been a topic of debate in the past reviewed in detail by Klein (1981). Clay tempering is a lower Mississippi Valley term that refers to inclusions of hardened clay particles that may or may not include ground ceramic sherds (Phillips et al. 1951; Phillips 1970). Grog tempering is a term commonly used by ceramic analysts working with American Bottom ceramic collections that refers to inclusions consisting of crushed ceramic sherds (Kelly 1982; O'Brien 1972; Vogel 1975). Because detailed petrographic examinations are needed to distinguish between different types of hardened clay tempers, the two terms will be used synonymously in this analysis. Vessel wall thickness was also measured on selected sherds for a representative sample of mean measurements for comparison with specifications in published literature. Paste color of a selected sample of Cypress variety sherds was also determined using the Munsell Soil Color Chart (1975).

Finally, the process of analysis was conducted in three additional steps: 1) sorting decorated and other distinctive sherds into the categories of culture, cultural phase, series, type, and variety as described by Farnsworth and Asch (1986), Griffin (1952) and other authors; 2) assessing and measuring attribute variables on a number of ceramic types and varieties where comparable data was available in literature, coupled with personal communication with the

regional archaeologist (Kenneth B. Farnsworth - May 1995); and 3) assessing the significance of similarities and differences between the Persimmon site ceramic assemblage and other ceramic assemblages from sites in the lower Illinois valley through literature research. The following presents the results of the formal ceramic analysis.

Analysis Results and Interpretation

Three hundred forty-three (49.2%) of the 697 prehistoric ceramic sherds recovered during Phase III investigations at the Persimmon site are attributable to the Early Woodland cultural period. Thirty-four (4.9%) sherds are assigned to the Middle Woodland period. Only 10 (1.4%) are identified as Late Woodland period sherds. Due to limiting factors such as size, and plain or eroded surfaces, the remaining 310 (44.5%) sherds could not be assigned to a particular cultural period. However, a cursory evaluation of their possible cultural affiliation was made when discussing the Type Indeterminate category. Finally, photographs of selected sherds of all ceramic varieties recovered during Phase III investigations at the Persimmon site are presented in Figures 29 though 37.

Early Woodland Period

The introduction and use of grit tempered pottery marks the beginning of the Early Woodland period in the Illinois valley. During this period the region was occupied at times by a group of people known as the Black Sand culture. Black Sand sites occur almost exclusively within the Mississippi and Illinois River valley trenches (Struever 1968b; Asch et al. 1978). In the Illinois valley, most sites with typical Black Sand ceramics are located on the valley floor of the Illinois River (Munson 1986:281). In the lower Illinois valley, Black Sand sites are most common along sand ridges at the margin of low river terraces, and like the Persimmon site, a few are also located on natural levees of the existing Illinois River channel (Struever 1968b; Farnsworth 1976).

This geographic distribution of Black Sand sites seems to reflect a strong reliance on harvestable aquatic resources that populate riverine environments and fauna that inhabit the wooded interface and edge environments that occur near river channels. Previously developed subsistence-settlement models have characterized the Black Sand culture as a generalized foraging economy since identified Black Sand components generally reflect a lack of food harvest or storage, and a shifting, temporary settlement (Perino 1964, 1966; Struever 1968b). However, evidence from more recent investigations in the lower Illinois valley has modified this view by indicating that at least some Black Sand sites may have been more intensively occupied base camps (Asch et al. 1978; Conner 1986).

Initially the Black Sand culture represented the first Early Woodland culture identified in Illinois (Cole and Deuel 1930). Recently however, it has been argued that Black Sand is known only by the appearance and recurrence of a particular ceramic decoration type and may have contributed little to the Early Woodland or later Middle Woodland traditions in Illinois. Moreover,

some suggest that Black Sand may only be represented by occasional visits to western Illinois by groups originating from regions outside the area (Munson 1982). The status of Early Woodland cultures in the Illinois and Mississippi Valley continues to be debated even today and further refinements are sure to be made (Farnsworth 1986).

The type site for the Black Sand culture is found at Liverpool Island where the Liverpool submound and Liverpool village were excavated by the University of Chicago in 1930 (Cole and Deuel 1937). Therefore the Black Sand culture has basically been tied to the widespread occurrence of a particular ceramic decoration type first documented at Liverpool, now known as the Liverpool series. As a result, the time extent of the Black Sand culture has also been confined to the span of time when Liverpool series ceramics occur (Struever 1968a:159).

Liverpool series ceramics remain specifically diagnostic of the Early Woodland Black Sand culture occupation in the lower Illinois valley (Farnsworth and Asch 1986). Decorative treatment consists of patterns of rectilinear incised lines, cord-wrapped-stick impressions, and stick-impressed or fingernail punctations over cordmarking. In the lower Illinois valley, tempering material consists of a mixture of large pieces of crushed chert, grit, limestone, and grog. Since chert is the dominant temper element in many cases, these sherds are referred to as "chert tempered." Paste color is a distinctive bright red-brown that ranges from 2.5YR4/4 or 4/6 to 5YR5/4 or 4/4 in the Munsell color system (Farnsworth and Asch 1986). These particular ceramics form a Liverpool series ceramic style zone that is totally encompassed within the lower Illinois valley. In this analysis, they are referred to as the *Cypress variety* associated with Black Sand occupations of the *Cypress phase* (Farnsworth and Asch 1986:382). The Cypress phase (550 B.C.-230 B.C.) (Farnsworth and Asch 1986:372, 443), which is also associated with *Villegas variety* ceramics, together with the tentatively defined *Schultze phase* associated with *Schultze variety* ceramics (these will be discussed below), impinge upon the southern end of the lower Illinois valley during the Early Woodland period.

Cypress Variety. Two hundred twenty-nine (32.8%) of the 697 sherds recovered during the Phase III investigation of the Persimmon site are examples of Liverpool series Cypress variety ceramics of the Cypress phase. The assortment of decorative types in the collection includes: 3 Parallel Incised, 1 Incised Diamond Crosshatched, 1 Chevron Incised, 1 Rectilinear Incised, 62 Incised (pattern indeterminate), 4 Fingernail Impressed, 1 Hemiconical Punctate, 31 Cordmarked, and 125 Liverpool (type indeterminate).

Vertical Distribution. One hundred eighty-three Cypress variety sherds were recovered from the 1 m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 22). Six (3.3%) were recovered from level 1 (0-10 cm Below Datum (BD)), 20 (10.9%) from level 2 (10-20 cm BD), 19 (10.4%) from level 3 (20-30 cm BD), 95 (51.9%) from level 4 (30-40 cm BD), 38 (20.8%) from level 5 (40-50 cm BD), and 5 (2.7%) from level 6 (50-60 cm BD).

Thirty-six Cypress variety sherds were recovered from the 50 x 50 cm units excavated at the Persimmon site (Table 2). Four (11.1%) were recovered from level 1 (0-10 cm BD), 10

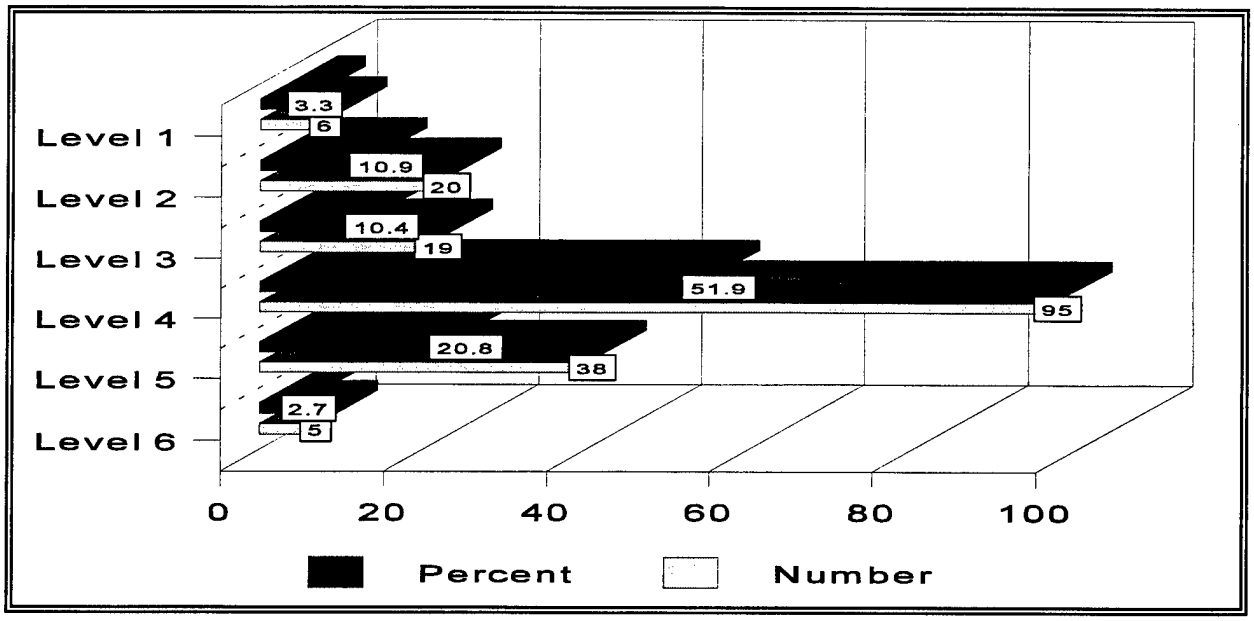


Figure 22. Vertical distribution of Cypress Variety sherds from all 1 m x 2 m test units.

(27.8%) from level 2 (10-20 cm DB), 14 (38.9%) from level 3 (20-30 cm BD), 5 (13.9%) from level 4 (30-40 cm BD), and 3 (8.3%) from level 5 (40-50 cm BD).

Horizontal Distribution. One (0.5%) of the 183 Cypress variety sherds recovered from the 1 m x 2 m test units came from Unit 1, 6 (3.3%) from Unit 2, 38 (20.8%) from Unit 3, 18 (9.8%) from Unit 4, 49 (26.8%) from Unit 5, 12 (6.5%) from Unit 6, 10 (5.5%) from Unit 7, 4 (2.2%) from Unit 8, 13 (7.1%) from Unit 9, and 32 (17.5%) from Unit 10 (Table 1) (Figure 21). In addition, one (2.8) of the 36 Cypress variety sherds recovered from the 50 x 50 cm units came from 0N/10W, 5 (13.9%) from 10N/10W, 4 (11.1%) from 0N/20W, 1 (2.8%) from 10N/20W, 1 (2.8%) from 20N/20W, 4 (11.1%) from 10S/20W, 2 (5.5%) from 20S/20W, 1 (2.8%) from 10N/30W, 1 (2.8%) from 30N/20W, 1 (2.8%) from 20S/30W, 1 (2.8%) from 30S/30W, 2 (5.5%) from 50S/30W, 3 (8.3%) from 0N/40W, 8 (22.2%) from 10N/40W, and 1 (2.8%) from 10N/50W (Table 2) (Figure 21). Also, Feature 1 contained 2 Cypress variety sherds and Feature 3 contained 3 (Table 3) (Figure 21). The East/West Deep Trench contained 3 Cypress variety sherds and the North and South Stripping Blocks (stripping) contained 1 Cypress sherd each (Table 3) (Figure 21).

Villegas Variety. Liverpool series Villegas variety ceramics are distinguished from Cypress variety ceramics in that they are sand tempered rather than chert tempered (Farnsworth and Asch 1986:389). These ceramics form a stylistically distinct assemblage at the Peisker site, another Black Sand culture site in the lower Illinois valley, located north of the Persimmon site (Perino 1966) (Figure 23). However, they remain associated with the Cypress phase in the lower Illinois valley where they are thought to appear late in the phase (Farnsworth and Asch 1986:382).

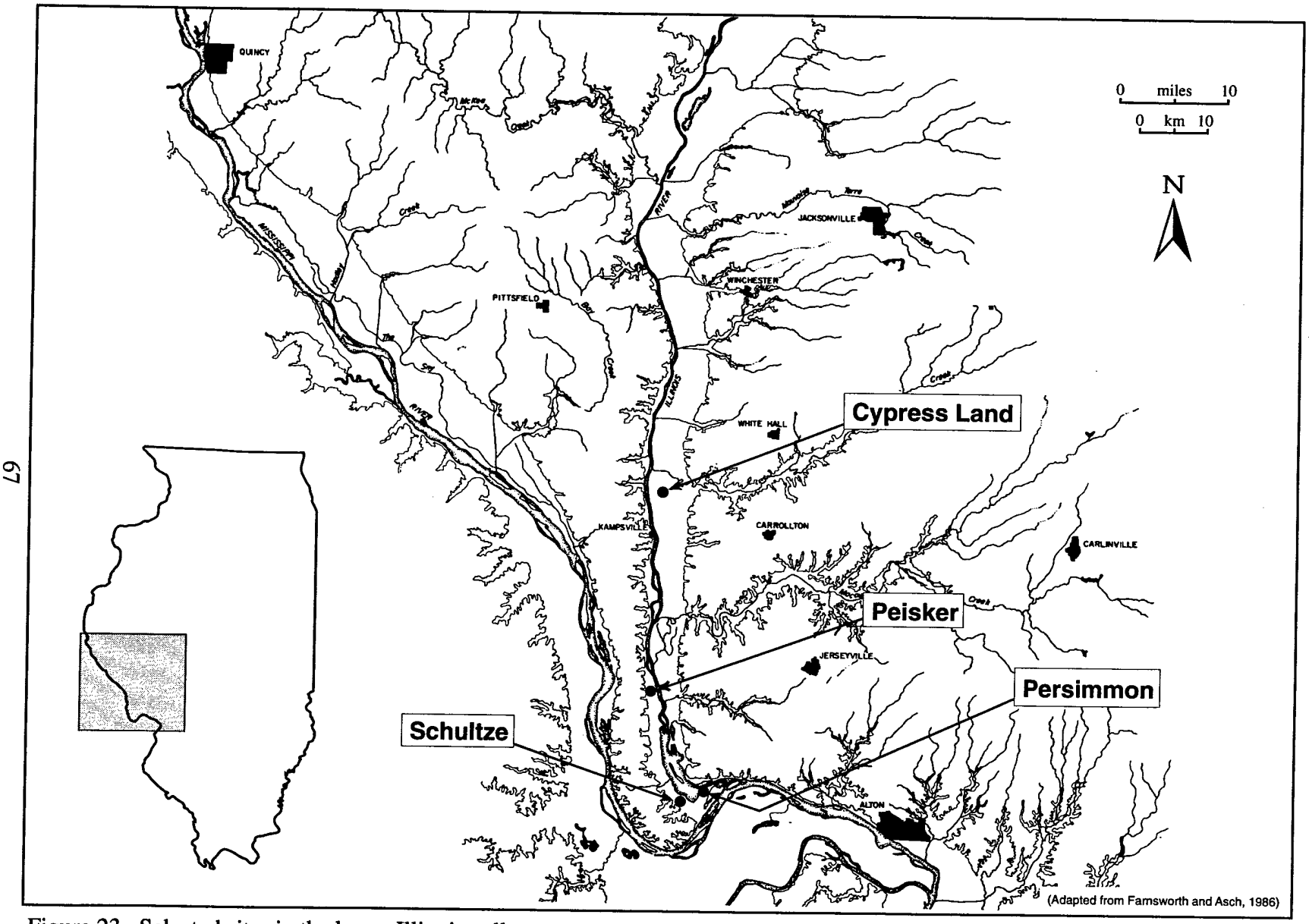


Figure 23. Selected sites in the lower Illinois valley.

Thirty-one (4.4%) of the 697 sherds recovered during the Phase III investigation of the Persimmon site are examples of Villegas variety ceramics of the Cypress phase. The assortment of decorative types includes: 6 Cordmarked, 5 Incised (pattern indeterminate), and 20 Liverpool (type indeterminate).

Vertical Distribution. Twenty-three Villegas variety sherds were recovered from the 1 m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 24). One (4.3%) was recovered from level 1 (0-10 cm BD), 1 (4.3%) from level 2 (10-20 cm BD), 2 (8.7%) from level 3 (20-30 cm BD), 17 (74.0%) from level 4 (30-40 cm BD), and 2 (8.7%) from level 5 (40-50 cm BD). In addition, one Villegas variety sherd was recovered from the 50x50 cm units excavated at the Persimmon site. It appeared at level 5 (40-50 cm BD) (Table 2).

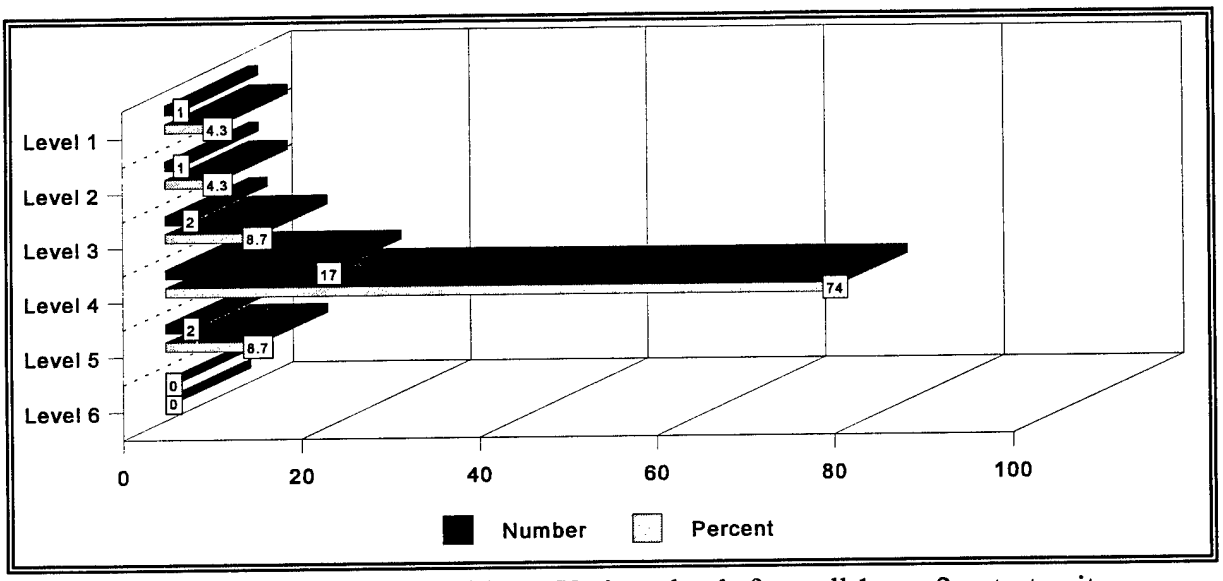


Figure 24. Vertical distribution of Villegas Variety sherds from all 1 m x 2 m test units.

Horizontal Distribution. One (4.3%) of the Villegas variety sherds recovered from the 1 m x 2 m test units came from Unit 1 (Table 1) (Figure 17), 2 (8.7%) from Unit 2, 1 (4.3%) from Unit 3, 1(4.3%) from Unit 5, 2 (8.7%) from Unit 8, 1 (4.3%) from Unit 9, and 15 (65.4%) from Unit 10. In addition, one Villegas variety sherd was recovered from the 50 x50 cm units excavated at the Persimmon site. It was recovered from 10S/20W. Also, six Villegas variety sherds were recovered from the South Stripping Block (stripping) (Table 3) (Figure 21).

Other Sand Tempered Sherds. One additional sand tempered Hemiconical Punctate sherd was recovered from the South Stripping Block (Table 3) (Figure 14c). It appears to be a Liverpool series sherd, however, this type has not been officially identified within the Villegas variety except in some text reference of western Illinois (Farnsworth and Asch 1986:426). Therefore it has been categorized merely as Liverpool Hemiconical Punctate, but may actually be an example of Griffin's (1952:100-101) Sister Creeks Punctated type.

Schultze Variety. Another ceramic variety appearing in the lower Illinois valley is Schultze.This variety is associated with the Schultze phase (no C14 dates, but believed to be contemporary with the Cypress phase) which was tentatively established on the basis of only 11 sherds collected at the Schultze site (Figure 23). These sherds were distinctly different from the ceramics documented for the Cypress phase sites to the north. The Schultze site is located approximately 18 km south of the previously defined southern limits of the Cypress phase ceramic distribution in the lower Illinois valley (Farnsworth and Asch 1986).

Schultze site ceramics are different from those of documented Black Sand sites to the north in that they are grog tempered, with some limestone mixed into the paste, and incised decorations have been applied over smoothed, as well as cordmarked, surfaces (Farnsworth and Asch 1986:415). All but two of the 11 Schultze variety sherds recovered from the Schultze site are decorated with parallel, rectilinear, or chevron patterns of incised lines. Ten additional incised Schultze variety sherds, two of which are rims, were recovered at the Peisker site that was previously the southernmost documented Cypress phase site in the region (Figure 23). Vessel lips are undecorated and slightly flattened. Although Schultze variety ceramics are distinctly different from Cypress phase Black Sand ceramics, their incised decorations make them contemporary.

Initially, the Schultze phase was tentatively established on the expectation that further evidence, such as the recovery of additional Liverpool series grog tempered sherds from the southern end of the Illinois valley, would provide further data to support the presence of a Schultze phase in the region. Indeed, Phase III investigations indicate that a Schultze phase component is present at the Persimmon site that has produced additional Schultze variety rim sherds which are decorated. These Chevron Incised examples have slightly flattened lips, with incised upper lip and cord-wrapped-stick interior lip decorations (Figure 32). The implications of this new information and the resulting change in the previously understood regional distribution of Schultze variety ceramics, as well as, the most southern extent of Cypress variety ceramics, will be discussed later.

Eighty-two (11.8%) of the 697 sherds recovered during the Phase III investigation of the Persimmon site are examples of Liverpool series Schultze variety ceramics. The assortment of decorative types in the collection includes: 33 Chevron Incised, 9 Incised (pattern indeterminate), 12 Cordmarked, and 28 Liverpool (type indeterminate).

Vertical Distribution. Sixty-five Schultze variety sherds were recovered from the 1m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 25). Three (4.6%) were recovered from level 2 (20-30 cm BD), 7 (10.8%) from level 3 (30-40 cm BD), 33 (50.8%) from level 4 (40-50 cm BD), and 22 (33.8%) from level 5 (50-60 cm BD). In addition, five sherds were recovered from the 50x50 cm units excavated at the Persimmon site (Table 2). Two (40.0%) were recovered from level 1 (0-10 cm BD), 1 (20.0%) from level 3, 1 (20.0%) from level 4 (40-50 cm BD), and 1 (20.0%) from level 5 (50-60 cm BD).

Horizontal Distribution. Eight (12.3%) of the 65 Schultze variety sherds recovered from the 1 m x 2 m test units came from Unit 2 (Table 1) (Figure 21), 1 (1.5%) from Unit 3, 1

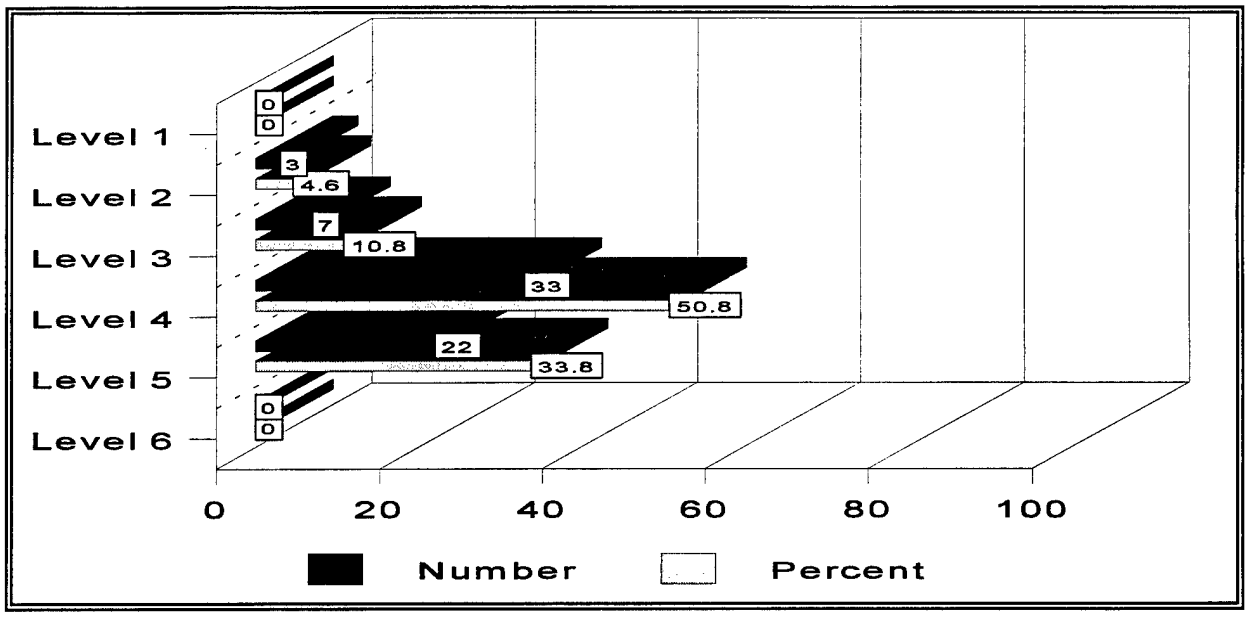


Figure 25. Vertical distribution of Schultze Variety sherds from all 1 m x 2 m test units.

(1.5%) from Unit 4, 4 (6.2%) from Unit 5, 42 (64.6%) from Unit 7, 4 (6.2%) from Unit 8, and 5 (7.7%) from Unit 9. In addition, one (20.0%) of the 5 Schultze variety sherds recovered from the 50 x 50 cm units came from 0N/10W (Table 2) (Figure 17), 1 (20.0%) from 10S/20W, 1 (20.0%) from 10N/30W, and 2 (40.0%) from 30N/20W. Also, Feature 1 contained 1 Schultze variety sherd and Feature 3 contained 11 (Table 3) (Figure 21).

Middle Woodland Period

Traditionally, archaeological literature of the lower Illinois valley has defined the early Woodland period as ending with a Black Sand culture phase. Therefore it was assumed that the Middle Woodland period would subsequently embrace the Havana cultural phases. If, given the assumption that the Havana culture developed locally from a Black Sand predecessor, archaeologists would expect to find ample evidence of a transitional phase (Struever 1968a, b). Indeed it appears that several phases of Woodland groups predated the appearance of Havana and Hopewell pottery in the central Illinois valley (Cole and Deuel 1937). Therefore, it was also thought that these phases could be chronologically piled into a developmental sequence.

To compensate for the lack of transitional phases appearing in the lower Illinois valley, Struever's (1968a:147-148) punctuated equilibrium model (Farnsworth 1986:634; Farnsworth and Asch 1986:438) assumed that the Woodland period in the lower Illinois valley was characterized by periods of relative stability punctated by brief episodes of rapid change. Consequently, brief transitional states are difficult to recognize in the archaeological record. The resulting proposed lower Illinois valley phase terminology was (earliest to latest) Marion, Black Sand, (?), Initial Havana, and Havana-Hopewell, with the (?) representing a yet to be found transformational phase.

However, this scenario has not been positively identified in the archaeological record of the region.

Large sites yielding Hopewell series ceramics are common in both the central and lower Illinois valley. However, these two adjoining areas are dissimilar in the frequency of evidence for earlier Middle Woodland occupations. In the lower Illinois valley, the youngest Black Sand/ Cypress phase radiocarbon dates from the Peisker site range from 260 B.C. to 230 B.C. After this there is a span of approximately 150 years for which this region lacks reliable dates. Following this hiatus, dates from various investigations conducted in the region suggest a 300-year span (50 B.C. to A.D. 250) for Havana culture occupations in the lower Illinois valley (Farnsworth and Asch 1986:445).

Furthermore, the contrast of Black Sand and Havana-Hopewellian cultures in the lower Illinois valley is dramatic. Liverpool series Cypress variety ceramics disappear and are immediately replaced by a radically different ceramic assemblage which includes Havana, Hopewell, Pike, and Baehr series ceramics. Ceramic decorative treatments, paste, temper, size, and shape of vessels are all very different from the preceding phases of the region. Rather than conforming to the initially proposed model that required the local Black Sand culture to be transformed through an evolutionary process into the succeeding local Havana-Hopewell culture, it appears that historical continuity is lacking in the lower Illinois valley sequence.

One explanation that may help to account for the absence of a transformational phase, is formulated in the twin-tradition model (Munson 1986; Farnsworth 1986:635-637; Farnsworth and Asch 1986:446). The absence of Marion or Initial Havana culture occupations in the lower Illinois valley, which occur in the central Illinois and Mississippi River valleys, may be because this region was Black Sand territory for a long period of time. Considering the apparent lack of evidence for lower Illinois valley occupations that are transitional from the Black Sand culture to a well-developed Havana culture, coupled with the sudden concurrent appearance of Havana, Hopewell, and Pike/Baehr ceramics, the twin-tradition model implies that the Havana occupation represents a major influx of people who possibly displaced or assimilated the region's long-term Black Sand population. The small quantity of Initial Havana ceramics evidenced in the archeological record of Black Sand sites in the area could be due to interaction between final resident Black Sand groups and contemporary Initial Havana groups.

Prior to the Phase III investigations at the Persimmon site the region immediately to the south of the Schultze site (Figure 23), including the area at and below the Illinois and Mississippi River confluence, was poorly known archaeologically. Therefore, this investigation has provided important information regarding the presence or absence of a transformational period between the Black Sand and Havana occupations of the region. This information and its implications regarding the punctuated equilibrium and twin-tradition models, as they apply to the lower Illinois valley, will be discussed below.

Havana Series. Twenty-one (3.0%) of the 697 sherds recovered during the Phase III investigation of the Persimmon site are examples of Havana series ceramics (Griffin 1952:101; Farnsworth and Asch 1986:421-447). These sherds are characterized by a loose sand and crushed grit temper with thick (8 to 10 mm) walls. Havana series ceramics are associated with the Havana culture of the Mound House phase (50 B.C.-A.D. 250) of the lower Illinois valley (Farnsworth and Asch 1986:331; 445).

The assortment of decorative types in the collection includes: 3 Havana Plain surfaced body sherds, 7 Havana (smoothed-over) Cordmarked body sherds, 7 Havana series incised (pattern indeterminate), and 2 Havana series incised (parallel/oblique) rim sherds from Feature 3. These 2 examples have flattened lips with cord-wrapped-stick impressed interior lip decorations (Figure 32).

Vertical Distribution. Three Havana Plain sherds were recovered from the 1 m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 26). One (33.3%) was recovered level 1 (0-10 cm BD), 1 (33.3%) from level 4 (40-50 cm BD), and 1 (33.3%) from level 5 (50-60 cm BD).

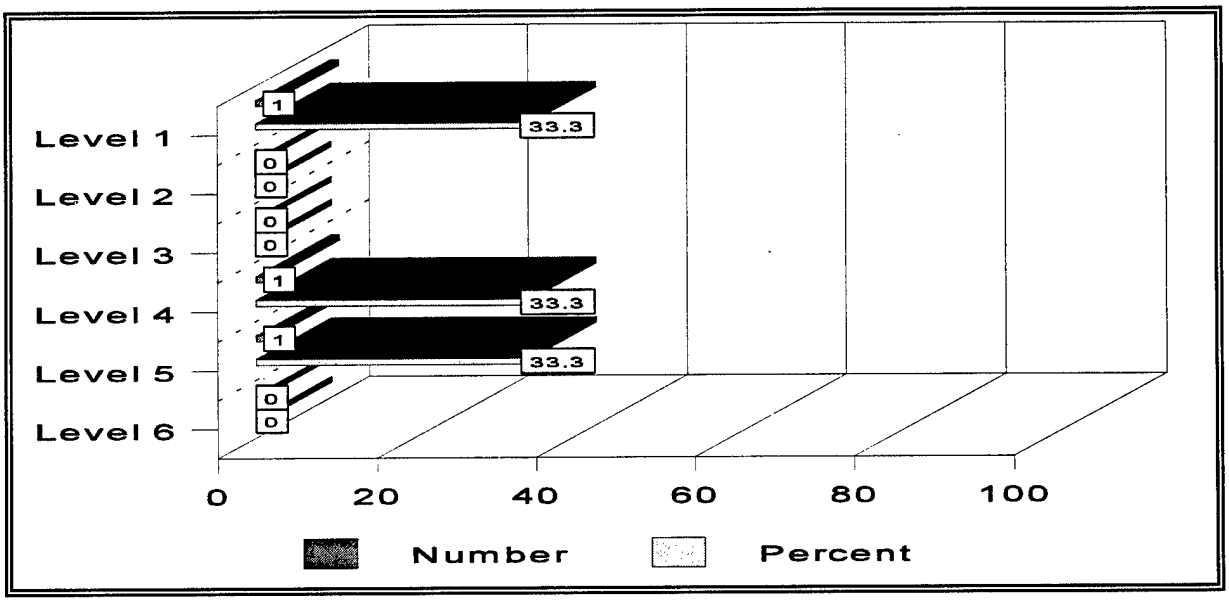


Figure 26. Vertical distribution of Havana Plain Variety sherds from all 1 m x 2 m test units.

Horizontal Distribution. Two (66.6%) Havana Plain sherds recovered from the 1 m x 2 m test units came from Unit 3 and one (33.3%) Havana Plain sherd came from Unit 5 (Table 1) (Figure 21). In addition, one Havana Cordmarked sherd was recovered from the South Stripping Block (Table 3) (Figure 21). Also, 6 Havana Cordmarked, 2 Havana series incised (parallel/oblique), and 7 Havana series incised (pattern indeterminate) sherds were recovered from Feature 3 (Table 3) (Figure 21).

Hemiconical Punctate. Two sherds recovered from Feature 3 were identified as Hemiconical Punctate and included in the Havana series collection from the Persimmon site (Table 3) (Figure 35a, b) (personal communication - Kenneth B. Farnsworth, May 1995).These sherds are probably examples of Griffin's (1952) Sister Creeks Punctated type (personal communication, Kenneth B. Farnsworth, May 1995). Early on in the central Illinois valley, this type was a catchall decorative category that encompassed "anything not incised or stamped" (Farnsworth and Asch 1986) applied to cordmarked-surface ceramics of this period. However, rims of this type became plain surfaced near the end of its time extent. These particular ceramics were not considered part of the Black Sand culture, but date to the Morton culture which is considered a direct descendent of Black Sand (Griffin 1952:100-101). Sister Creeks Punctated ceramics appear near the latter portion of the Late Marion/Early Morton phase (ca. 400 B.C-250 B.C.) in the central Illinois valley and continue through the Late Morton/Caldwell phase (ca. 250 B.C.-150 B.C.), subsequently decreasing markedly early in the Fulton phase (ca. 150 B.C.-A.D.1) (Munson 1986:291-292).The 2 Hemiconical Punctate sherds from the Persimmon site have a tight clay or grog temper that is not necessarily consistent with Havana temper characteristics.

Pike/Baehr Series. Twelve (1.7%) of the 697 sherds recovered from the Persimmon site were examples of Pike/Baehr series ceramics (combined here due to similar characteristics) which are associated with the Mound House phase (50 B.C.-A.D. 250) (Struever 1968a; Farnsworth and Asch 1986:331, 335). The Pike/ Baehr ceramic series are primarily restricted to the Illinois valley. They are related in characteristics such as compacted paste, crushed limestone temper, and brushed, combed, scratched, and rockered surface treatment (Morgan 1985:204). However when unzoned, these surface treatments are considered as nondecorative surface treatments (Morgan 1986:383). Other Pike/Baehr sherds have similar characteristics but are not limestone tempered. The twelve Pike/Baehr sherds recovered from the Persimmon site are not limestone tempered. However, most of them exhibit tiny holes on both surfaces that may be the remnants of dissolved limestone particles (Griffin 1952:115).

Vertical Distribution. All ten Pike/Baehr series sherds were recovered from the 1 m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 27). Four (33.3%) were recovered from level 2 (20-30 cm BD), 2 (16.7%) from level 3 (30-40 cm BD), and 6 (50.0%) from level 4 (40-50 cm BD).

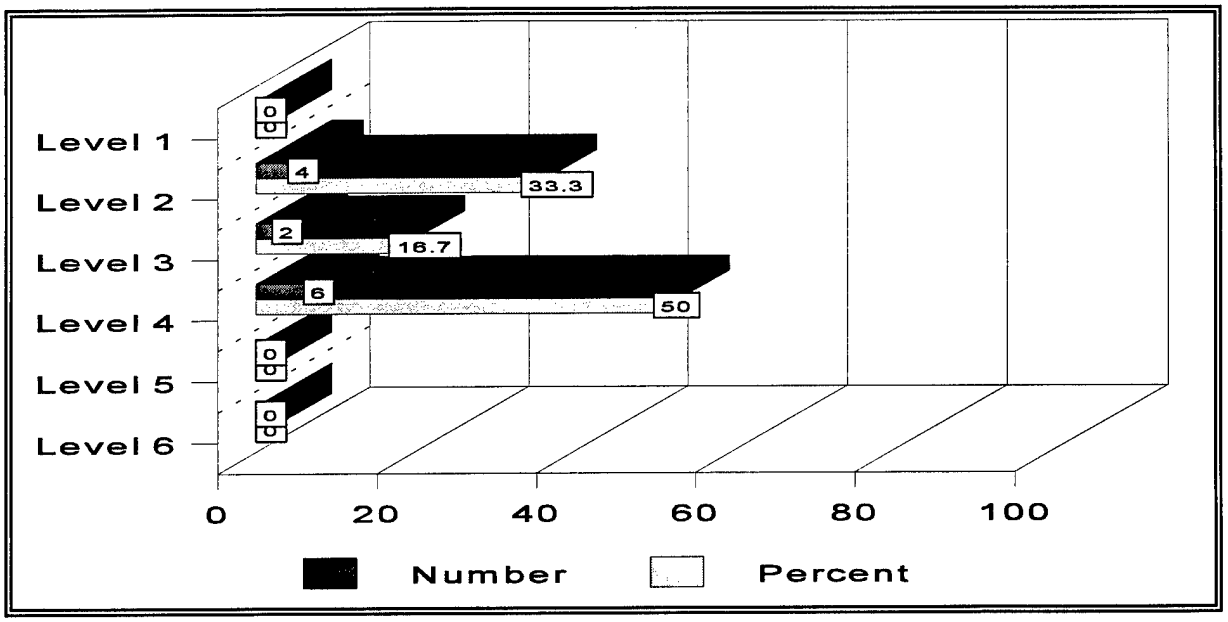


Figure 27. Vertical distribution of Pike/Baehr Variety sherds from all 1 m x 2 m test units.

Horizontal Distribution. Seven (58.3%) of the Pike/Baehr sherds were recovered from Unit 6 (Table 1) (Figure 21), 4 (33.3%) from Unit 9, and 1 (8.3%) from Unit 10.

Hopewell Series. Only one (0.14%) of the 697 sherds recovered from the Persimmon site was positively identified as an example of Hopewell series ceramics that are also associated with the Mound House phase (50 B.C.- A.D. 250) of the lower Illinois valley (Farnsworth and Asch 1986:331, 335). This small sherd exhibits fine cross-hatching placed on a slightly convex or channeled rim (Figure 30a). Paste is compact and consists of a fine sand and clay temper. It was recovered from level 3 (30-40 cm BD) of Unit 6 (Table 1).

Late Woodland Ceramics

Late Woodland activity at the Persimmon site is indicated by the presence of 10 Weaver/White Hall Cordmarked sherds. Two of these sherds have a compact paste which consists of a sand and crushed grit temper and are probably examples of Weaver ceramics (Griffin 1952:121-122; Wray and MacNeish 1961:52). In the central Illinois valley, these ceramics are associated with the Weaver phase (A.D. 400-A.D. 700). Because of its ceramic intergradings with Havana ceramics, Weaver was initially defined temporally as beginning with the terminal Hopewell stages and continuing into the Late Woodland period (Wray and MacNeish 1961:51). Later, Griffin et al. (1970:9) identified these ceramics with post-Hopewellian populations of the Weaver phase of the early Late Woodland period.

The remaining eight sherds are thin and sand tempered, probably examples of White Hall ceramics. Struever (1968a:169) defined White Hall ceramics from the lower Illinois valley by noting their comparability to Weaver ceramics. The primary difference between the two is that Weaver ceramics are generally grit tempered while White Hall is sand tempered. White Hall's chronological placement at the beginning of the Late Woodland period parallels that of Weaver. Therefore, considering the similarities between Weaver and White Hall ceramics and the presence of both crushed grit and sand tempered examples in the collections from the Persimmon site, they were referred to as Weaver/White Hall.

Vertical Distribution. Nine of the Weaver/White Hall sherds were recovered from the 1 m x 2 m test units excavated at the Persimmon site (Table 1) (Figure 28). One (11.2%) was recovered from level 3 (30-40 cm BD), and 8 (88.8%) from level 4 (40-50 cm BD).

Horizontal Distribution. Three (33.3%) of the Weaver/White Hall sherds were recovered from Unit 6 and 6 (66.6%) were from Unit 9 (Table 1) (Figure 21). In addition, 1 White/Hall sherd was recovered from the South Stripping Block (Table 3) (Figure 21).

Type Indeterminate

The remaining 310 sherds were classified only as Type Indeterminate due primarily, with a few exceptions, to their small size and plain or deteriorated surfaces. The paste and thickness of the 34 Type Indeterminate sherds recovered from the 1 m x 2 m test units, 50 x 50 cm test units, and the stripping blocks, in addition to 9 type indeterminate sherds recovered from Feature 1, are somewhat consistent with an Early Woodland designation. Those with decorations have design elements similar to Black Sand ceramics.

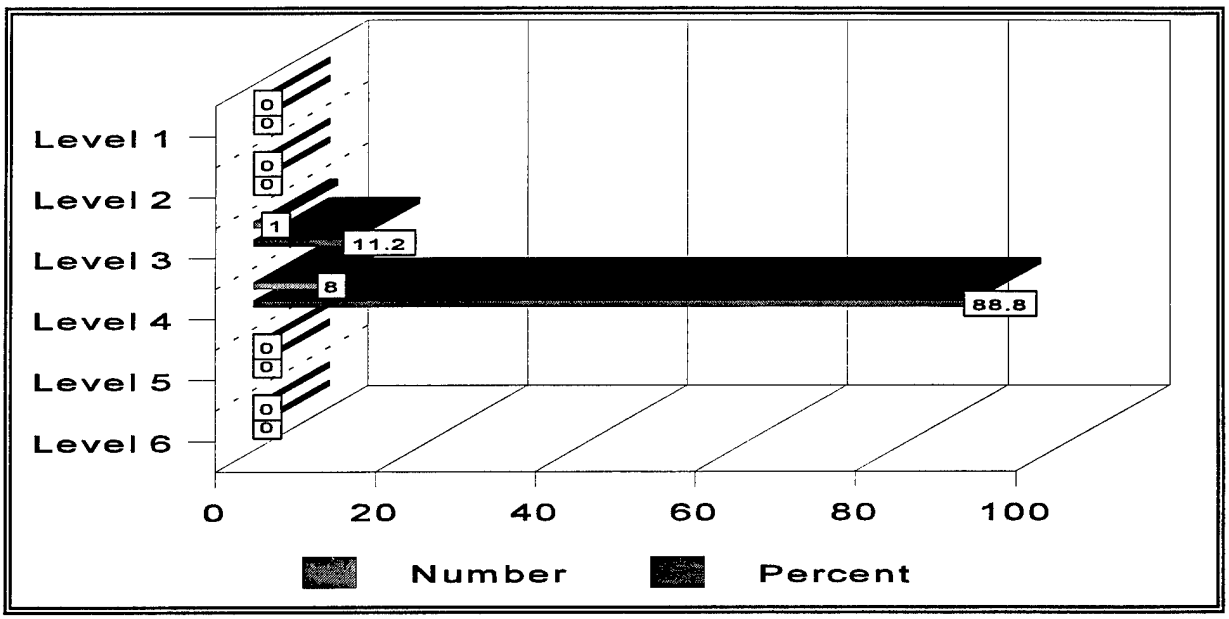


Figure 28. Vertical distribution of Weaver/White Hall Variety sherds from all 1 m x 2 m test units.

Feature 3 contained 265 sherds that were classified as type indeterminate. One hundred ninety-nine were recovered from a float sample and are extremely small. The vast majority of these 265 sherds have smoothed or plain surfaces with a loose crushed grit temper. Their paste and thickness are somewhat consistent with a Middle Woodland designation. Other examples of Type Indeterminate ceramics recovered from Feature 3 include 2 crushed grit-tempered, smoothed or plain surfaced rim sherds (Figure 35e, f) of a possible Middle Woodland bowl, and a grog-tempered, plain surfaced, nodded vessel fragment (Figure 35i).

Discussion

The composition of the ceramic collection from the Persimmon site indicates that its major occupation dates to the Early Woodland period. In addition, the intact portion of the cultural deposit present at the site is primarily associated with this Early Woodland component. Most of the classifiable sherds were recovered from the terrace remnant where the intact cultural deposit is present, although some of these sherds were found in the post-occupational alluvium deposit that caps the project area. Furthermore, all of the classifiable sherds recovered from the 50 x 50 cm test units, which were excavated on the portion of the site where the eroded terrace escarpment is located, appear to have been redeposited downslope as the terrace has eroded. Therefore, the remainder of this discussion will focus on the classifiable sherds which were recovered from the test units and features excavated on the terrace where the intact portion of the cultural deposit is present.

A total of 320 classifiable sherds was recovered from the 1 x 2 m and 50 x 50 cm test units excavated on the terrace during Phase III investigations at the Persimmon site. Of this total, 295 (92.2%) are examples of Early Woodland Black Sand ceramics. Sixteen (5%) sherds are examples of Middle Woodland ceramics. The remaining 9 are Late Woodland Weaver/Whitehall sherds. Also, a total of 34 classifiable sherds was recovered from two of the three features excavated at the site, including 3 Early Woodland sherds from Feature 1, and 14 Early Woodland sherds and 17 Middle Woodland Havana sherds from Feature 3. All of the classifiable sherds recovered in the 50 x 50 cm test units excavated on the terrace escarpment are examples of Early Woodland Black Sand ceramics, some of which are redeposited.

The vertical distribution of classifiable ceramics recovered from all the test units excavated on the terrace indicates that Early Woodland sherds occurred in levels 1 through 6 (0-60 cm BD), Middle Woodland sherds occurred in levels 1 through 5 (0-50 cm BD) and Late Woodland sherds were confined to levels 3 and 4 (20-40 cm BD) (Table 4). However, of this distribution Early Woodland sherds occur in much greater frequency than either Middle or Late Woodland sherds in each of the six levels yielding ceramics. For example, of the 73 classifiable sherds recovered from the fifth and sixth levels (40-60 cm BD), all but one are examples of Early Woodland ceramics (Table 4). A further breakdown of ceramic varieties by unit and level association is presented in Table 5.

Table 4. Distribution of diagnostic ceramics recovered in test units located on terrace.

Location	L1	L2	L3	L4	L5	L6	Total
1 m x 2 m Units							
Havana	1	4	3	7	1		16
Cypress	6	20	19	95	38	5	183
Villegas	1	1	2	17	2		23
Schultze		3	7	33	22		65
Total	8	28	31	152	63	5	287
.5 m x .5 m Units							
Cypress	1	4	6	5	3	19	38
Villegas					1	1	2
Schultze	1		1	1	1	4	8
Total	2	4	7	6	5	24	48
All units combined							
Late Woodland			1	8			9
Middle Woodland	1	4	3	7	1		16
Early Woodland	9	28	35	151	67	5	295
Total	10	32	39	166	68	5	320
Overall Total	20	64	77	324	136	34	655

Although the geomorphological study indicates that a post-occupational alluvium deposit, which may contain some redeposited sherds, caps most of the site, the extent to which the temporally discrete deposits have been mixed is limited (see Chapter IV). Also, the relative frequency of Early, Middle, and Late Woodland sherds indicate the intact cultural deposit, when

Table 5. Vertical distribution of classifiable ceramics within 1 m x 2 m test units.

Location	L1	L2	L3	L4	L5	L6	Total
Unit 1							
Cypress					1	1	2
Villegas		1				1	2
Total		1			1	2	4
Unit 2							
Cypress		1	1	3	1	6	12
Villegas			1	1		2	4
Schultze				1	7	8	16
Total		1	2	5	8	16	32
Unit 3							
Havana				1	1	2	4
Cypress	2	5	4	16	11	38	76
Villegas				1		1	2
Schultze		1				1	2
Total	2	6	4	18	12	42	84
Unit 4							
Cypress			4	7	4	3	18
Schultze					1		1
Total			4	7	5	3	19
Unit 5							
Havana	1	5	5	35	3	49	98
Cypress	1					1	2
Villegas	1					1	2
Schultze			1	2	1	4	8
Total	3	5	6	37	4	55	110
Unit 6							
Havana		2	3	3		8	16
Cypress		2	1	7	2	12	24
Total							
Unit 7							
Cypress	2	4	2		2	10	20
Schultze			4	29	9	42	84
Total	2	4	6	29	11	52	104
Unit 8							
Cypress	1	2		1		4	8
Villegas				2		2	4
Schultze		1	1		2	4	8
Total	1	3	1	3	2	10	20
Unit 9							
Havana		2		2			4
Cypress		1	1	8	2	1	13
Villegas			1				1
Schultze		1	1	1	2		5
Total		4	3	11	4	1	23
Unit 10							
Havana				1			1
Cypress			1	18	12	1	32
Villegas				15			15
Total			1	34	12	1	48

considered as a whole, is essentially an Early Woodland deposit. Furthermore, while ceramics associated with each of the three components occur most frequently in levels 3 and 4 (20-50 cm BD), a much larger proportion of the Early Woodland ceramic assemblage occurs in levels 4 and 5 (30-60 cm BD) than is the case with the Middle or Late Woodland ceramic assemblages. This pattern, together with the paucity of Middle or Late Woodland ceramics below 40 cm BD, suggests that the lower portion of the major occupational zone appears to be almost exclusively associated with occupations dating to the Early Woodland period.

While the horizontal distribution of Early Woodland ceramics occurs across the site, the distribution of Middle Woodland ceramics is concentrated in two areas within the investigated portion of the site. One area is located at the north end of the project area and the other area on either side of the construction corridor centerline (Figure 21). The Middle Woodland Havana sherds recovered in Test Units 5, 6, 9, and 10 represent the more northern of the two concentrations. Those recovered from Test Unit 3 and Feature 3 represent the other. All of the Late Woodland sherds were recovered from Test Units 6 and 9, suggesting that this component is primarily restricted to the extreme northern end of the project area. Interestingly, 75% of the Middle Woodland Havana sherds were recovered from the same two units that yielded all the Late Woodland sherds (Table 5).

Three prehistoric features were identified during stripping operations at the Persimmon site. Features 1 and 2 were identified at the base of the stripped area, at a depth of 49 cm BD and 55 cm BD, respectively, and Feature 3 was identified in the wall of a stripping trench at a depth of 42 cm BD. Each feature is a shallow basin characterized by gradually insloping walls without a distinct break between the sides and the bottom. In plan view, Feature 1 is circular, while Features 2 and 3 are oval. The fills of each feature consist of a single fill zone of dark brown to very dark brown silty, sand, and present no evidence of *in situ* burning.

A moderately large number of artifacts were recovered from Features 1 and 3, including diagnostic ceramics and nondiagnostic chipped and smoothed stone, but only a single flake was recovered from Feature 2. Early Woodland/Black Sand/Schultze variety ceramics were recovered from Features 1 and 3. In addition to Black Sand ceramics, Feature 3 also contained several Havana sherds.

Feature 3 is extremely significant since it contained both Black Sand Liverpool series ceramics and Havana series ceramics, suggesting it may date to the hypothetical Early Woodland/Middle Woodland transitional period (200 B.C.-50 B.C.). The Liverpool ceramics from this feature include Cypress and Schultze variety sherds. The presence of both Black Sand Liverpool series ceramics and Havana series ceramics in the same feature suggests that the vertical distribution of Middle Woodland ceramics in the test units excavated on the terrace is not the result of mixing, but, instead, indicates that the Liverpool series sherds and the Havana series sherds are contemporaneous, at least during later portions of the Cypress and Schultze phases. The only factor that may contradict this interpretation is the possibility that Feature 3 is a Middle Woodland feature subsequently contaminated with Early Woodland fill. Nevertheless, the contents of Feature

3 do not support evidence of transitional ceramic styles between the Black Sand and Havana cultures, but rather, continue to demonstrate distinct ceramic stylistic differences between the late Early Woodland and Middle Woodland periods of the region. A wood charcoal sample obtained from flotation material from Feature 3 returned an unacceptable radiocarbon date of 130 +/- 50 BP (Beta-82288). A bulk soil sample from Feature 1, which contained a few Cypress and Schultze variety sherds, has returned a date of 1570 +/- 60 BP (Beta-82039), which also appears unacceptable.

In view of the information obtained from Feature 3, it appears that three discrete phases, two associated with Early Woodland and one with early Middle Woodland, were contemporaneously occupying portions of the lower Illinois valley sometime during 200 B.C. to 50 B.C. Cypress phase people were probably the first and most intensive occupants of the Persimmon site, since Cypress variety ceramics account for the largest proportion and longest vertical distribution of sherds, extending into level 6 which precedes in time both the Schultze and Havana phases. Villegas variety sherds of the Cypress phase and Schultze variety sherds of the Schultze phase appear slightly later in level 5, but afterwards remain contemporaneous with Cypress variety ceramics. Initially, one Havana sherd appears in level 5, followed by an increase of Havana sherds in level 4, afterwards remaining contemporaneous with both Cypress and Schultze phase ceramics. Then slightly later in level 3, 1 Hopewell series sherd appears.

Pike/Baehr ceramics, and, curiously, a few Late Woodland/Weaver/White Hall ceramics, also initially occurred in level 4. These sherds, however, were basically confined to Units 6 and 9, which were placed on, or near, the natural levee that transects the site. The Unit 6 soil profile reflects a dipping of the upper strata as they follow the natural slope of the levee. Since test excavations were conducted using arbitrary levels which crosscut natural strata, relative depths might be slightly askew. However, the test results obtained in Unit 9 are similar to those obtained in nearby Unit 6. Therefore, the integrating of Cypress, Schultze, Pike/Baehr, and Havana sherds is apparently not the result of mixing. Furthermore, it is not unreasonable to assume that Pike/Baehr ceramics are relatively contemporaneous with Havana in the lower Illinois valley (Farnsworth and Asch 1986:445). Also, it is not unusual to encounter Middle Woodland ceramics integrated with Weaver ceramics. Because of similar situations, Weaver ceramics were early on mistakenly associated with the Terminal Middle Woodland period in the central Illinois valley (Wray and MacNeish 1961:51).

This sequential superpositional occurrence of discrete diagnostic ceramics at the Persimmon site seems entirely consistent and even expected when compared with the chronological record of the Illinois valley. Moreover, evidence of the initial occurrence of specific phases associated with these periods must also be assumed to be relatively correct. Therefore this information implies that, at the Persimmon site, the Cypress phase slightly predates the Schultze phase, but subsequently, both phases remained contemporaneous into the beginning of the early Middle Woodland period when distinctly different Havana and Pike/Baehr ceramics (and 1 Hopewell series sherd which occurs in context slightly later than Havana and Pike/Baehr) appear in context

with, and apparently contemporaneous with, examples of both Cypress and Schultze phase ceramics.

Assuming the outlier date of 40 B.C. (obtained from the Peisker site) for the end of the Cypress phase in the lower Illinois valley is too young, and the earlier defensible date of 230 B.C. (also obtained from the Peisker site) is correct (Farnsworth and Asch 1986:370, 372, 443), the context of the Persimmon site seems sufficient ground to argue for a much earlier date than 50 B.C. for the initial appearance of Havana in the extreme lower Illinois valley. Consequently, an earlier initial appearance date for Havana in the region better explains its contemporaneity with the indigenous Cypress and Schultze phase, especially since Havana is present in the central Illinois valley as early as 400 B.C., and appears in the American Bottom (south of the Persimmon site) by 150 B.C. (Farnsworth and Asch 1986:331; Fortier et al. 1984: 80-85; Munson 1986:291). Therefore, when considering these dates and their geographic location on either side of the current project area (Figure 23), it seems safe to assume that the initial appearance of Havana at the Persimmon site could have occurred as early as 200 B.C. to 250 B.C.

Summary

Since no reliable radiocarbon dates have been secured to this point from the Persimmon site, the following interpretation is based predominately on information gained by: (1) comparing ceramics from the site with ceramics from other sites in the central and lower Illinois valley; (2) then, using the assigned dates of these similar ceramics as chronological indicators for sherds from the Persimmon site; (3) finally, applying the comparison results with the depth association data of these sherds as they occurred in the context of the site which produced the following time specific cultural phase sequence.

The Persimmon site was occupied first by people of the Cypress phase (550 B.C.- 230 B.C). These people possessed Cypress variety ceramics and also, somewhat later, Villegas variety ceramics. This initial occupation, or series of occupations, was followed by a Schultze phase occupation typified by the presence of Schultze variety ceramics. People of these two Black Sand cultural phases apparently occupied portions of the lower Illinois valley contemporaneously, at least into the early Middle Woodland period (200 B.C.- 50 B.C.) when the distinctly different Havana series ceramics appear in immediate context with examples of Black Sand variety ceramics. Evidence that further supports the fact that the Schultze phase slightly precedes Havana, is revealed by the difference in initial discovery depths of Features 1 and 3. Feature 1, which contained Cypress and Schultze variety ceramics, was identified at 49 cm BD, while Feature 3, which contained Cypress and Schultze variety ceramics together with Havana series ceramics, was identified at a shallower depth of 42 cm BD.

Therefore, it appears that discrete groups of the Early Woodland Cypress and Schultze phase encountered people who possessed Havana ceramics, or vice versa. Mixed into this blend are a few examples of Sister Creeks (400 B.C.- 100 B.C.) sherds which are associated with some

early Middle Woodland transitional phases in the central Illinois valley and may have been transported to the lower Illinois valley area contemporaneously with Havana ceramics. Following closely after, or possibly contemporaneous with, the initial occurrence of Havana at the Persimmon site, is the appearance of a small representation of Pike/Baehr ceramics. The presence of these ceramics may represent a minor occupation of the Persimmon site by people of the Mound House phase of the lower Illinois valley. One Hopewell series sherd may be also associated with this occupation. Finally, a possible occupational hiatus may have occurred at the site between the Mound House phase occupation and the much later Late Woodland occupation represented by a few Weaver/Whitehall sherds (A.D. 400 - A.D. 700).

Research Questions

The results of the ceramic analysis and its interpretation in the context of the Persimmon site seem to support the twin-tradition model as proposed and defined by Farnsworth and Asch (1986:446) (Farnsworth 1986:637-638) for the lower Illinois valley. Phase III investigations at the site produced no evidence of a transformational phase between the Black Sand and Havana culture. Instead, fully developed examples of Havana ceramics suddenly appear in direct context with discrete examples of Black Sand ceramics within an intact, predominately Black Sand, cultural deposit.

These phenomena are further supported and compellingly demonstrated in Feature 3 where fragments of a possible Middle Woodland bowl, portions of a Havana series jar, portions of a smooth surfaced nodded vessel, and a moderately large Sister Creeks rim sherd were deposited together with examples of Black Sand Cypress and Schultze phase ceramics. Therefore, this feature may indeed date to the period between 200 B.C. and 50 B.C. If this is the case, there is a strong possibility that no transitional phase actually exists between Black Sand and Havana in this portion of the extreme lower Illinois valley. Furthermore, it appears that the Black Sand culture of the region did not develop, or evolve into, or even contribute to, the succeeding Havana culture as is the case in areas of the Sny Bottom and central Illinois valley. Conversely, it appears that the Black Sand culture remained a discrete entity that was coexistent with an intruding Havana culture possibly well into the early Middle Woodland period when they were eventually completely replaced by Havana. Therefore, the absence of a transitional phase does not necessarily reflect a void in the archaeological record of the lower Illinois valley.

Finally, the punctuated equilibrium model (Struever 1968a) that proposes periods of relative stability punctated by brief episodes of rapid change, evidence of which would be difficult to perceive in the archaeological record, does not appear to apply at the Persimmon site. Since evidence needed to support this model would have to be captured in a very short time span of the archaeological record, it appears that the contents and context of Feature 3 refute the pretense of punctuated equilibrium, and instead establishes the credence of the twin-tradition model, at least in the extreme lower Illinois valley.

Conclusion

Study of the ceramic remains from the Phase III investigation of the Persimmon site has produced important information concerning cultural change in the extreme southern extent of the lower Illinois valley by: (1) providing evidence contributing to the further establishment of the Schultze phase in the region; (2) the recovery of additional Schultze variety ceramics, including identification of additional decorative elements applied to rim and lip areas of this variety; (3) providing evidence that the Schultze phase occurs later than the Cypress phase, at least at the Persimmon site; (4) providing evidence that the Cypress and Schultze phase were contemporaneous and coexistent with Havana for sometime; (5) providing new information that expands the geographic distribution of Liverpool series ceramic style zones farther south into the extreme southern extent of the Illinois valley; (6) providing evidence to support the assumption that a transitional phase (phases) probably does not exist between Black Sand and Havana in this portion of the lower Illinois valley; (7) providing evidence that Black Sand contributed little, if anything, to the culture that succeeded it in this region; (8) indicating that the Havana culture was well developed when it entered this portion of the lower Illinois valley; (9) providing a glimpse into the time span between 200 B.C.- 50 B.C. of this region that was relatively unknown archaeologically, previous to this investigation; and (10) indicating that the Black Sand culture of the region was possibly intruded upon by an expanding Havana culture from the north.

There is no evidence of the Black Sand culture in the American Bottom that is immediately adjacent to the lower Illinois valley. For reasons unknown, there seems to have been a now invisible boundary near the Mississippi and Illinois River confluence during certain portions of prehistory in this area. Therefore, if the Black Sand culture of this portion of the lower Illinois valley was not assimilated into the succeeding Havana culture but was eventually displaced, it is evident that they did not move south. Since the initial appearance of the Black Sand culture in the upper Midwest seems to have been around 600 B.C. in the precise region where the Persimmon site is located, and this region is at the southern limits of its distribution, it appears that remnants of the culture must have moved north, or possibly returned to the area from whence they came, as some researches have proposed (Munson 1982:12). However, its interesting to note that earlier researchers in the Midwest indicate that a possible preceramic precursor to the Black Sand culture in the Illinois valley lies not to the north, but rather to the south in extreme southern Illinois (Maxwell 1952:179; 186).

Regardless of the impetus of Black Sand, the chronological distribution of the initial appearance of incised-over-cordmarked pottery, which is a typifying characteristic of Black Sand after approximately 550 B.C., seems to be from south to north beginning in and around the lower Illinois valley and spreading up the Mississippi, Missouri, and possibly Illinois Rivers initially reaching areas of Minnesota around A.D. 1. In portions of the upper Midwest, Black Sand cultural phases and ceramic style zones persist until almost A.D. 900 (Farnsworth 1986:636). Therefore, this may have been the route that the Cypress and Schultze phase people followed after their eventual displacement in the lower Illinois valley by Havana.

Figure 29. Cypress, Villegas, and Schultze variety sherds, Persimmon site.

a. Villegas variety (plain dow impressed) rim, Unit 2, level 3

b. Chevron Incised, Cypress variety, Unit 3, level 4

c. Parallel Incised, Cypress variety rim, Unit 3, level 4

d. Cordmarked, Villegas variety, Unit 3, level 4

e. Cordmarked, Schultze variety (Flat rim with CWS impressions on top of rim), pock marks due to erosion, Unit 4, level 5

f. Plain rim, Cypress variety, Unit 5, level 4

g. Incised (pattern indeterminate), Cypress variety rim, Unit 5, level 4

h. Incised Diamond Crosshatched, Cypress variety, Unit 5, level 4

i. Chevron Incised, Schultze variety (slightly flattened incised rim lip), Unit 5, level 4

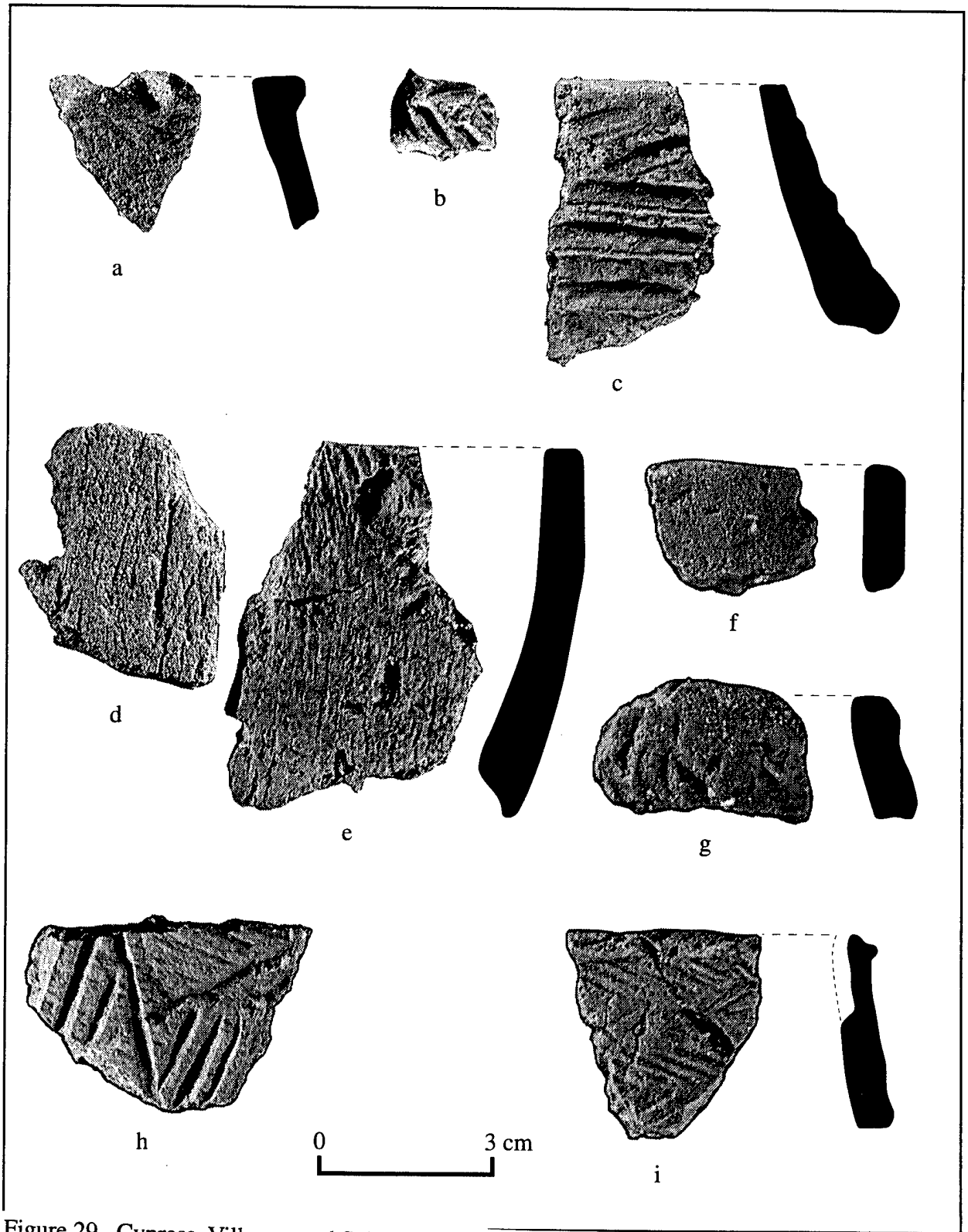


Figure 29. Cypress, Villegas, and Schultze variety sherds, Persimmon site.

Figure 30. Cypress and Schultze variety, and Hopewell and Weaver/White Hall series sherds, Persimmon site.

a. Hopewell (crosshatched rim), Unit 6, level 3

b. Incised (pattern indeterminate), Unit 6, level 4

c. Incised (pattern indeterminate), Cypress variety, Unit 6, level 4

d. Pike/Baehr (brushed surface), Unit 6, level 4

e. Pike/Baehr (brushed surface), Unit 6, level 4

f. Cordmarked, Weaver/White Hall, Unit 6, level 4

g. Cordmarked, Weaver/White Hall, Unit 6, level 4

h. Incised (pattern indeterminate), Cypress variety, Unit 7, level 1

i. Chevron Incised, Schultze variety rim, Unit 7, level 4

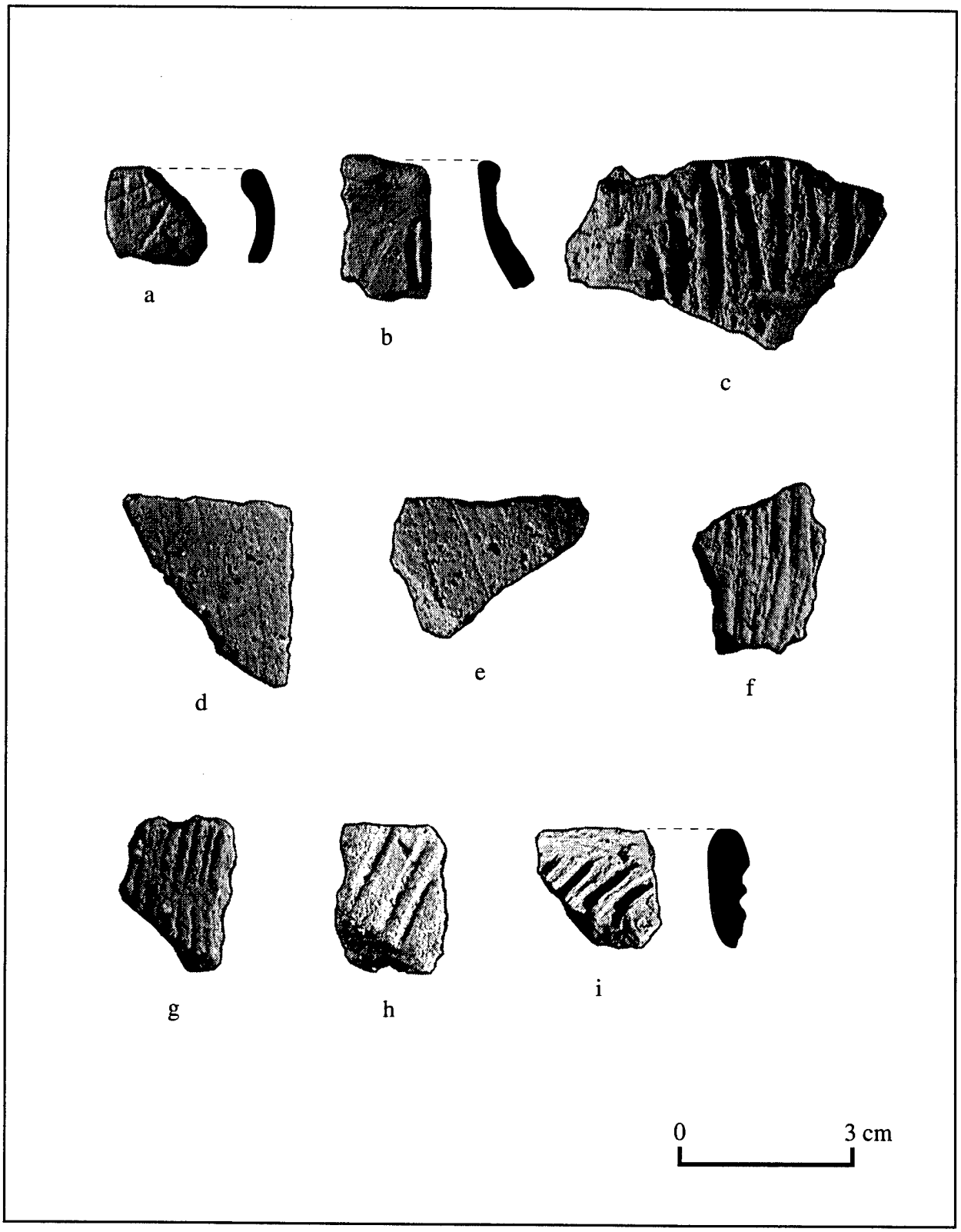


Figure 30. Cypress and Schultze variety and Hopewell and Weaver/White Hall series sherds, Persimmon site.

Figure 31. Schultze variety sherds, Persimmon site.

a. Chevron Incised, Schultze variety, Unit 7, level 4 and 5

b. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

c. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

d. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

e. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

f. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

g. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

h. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

i. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

j. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

k. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

l. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

m. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

n. Schultze variety rim

o. Chevron Incised, Schultze variety, Unit 7, levels 4 and 5

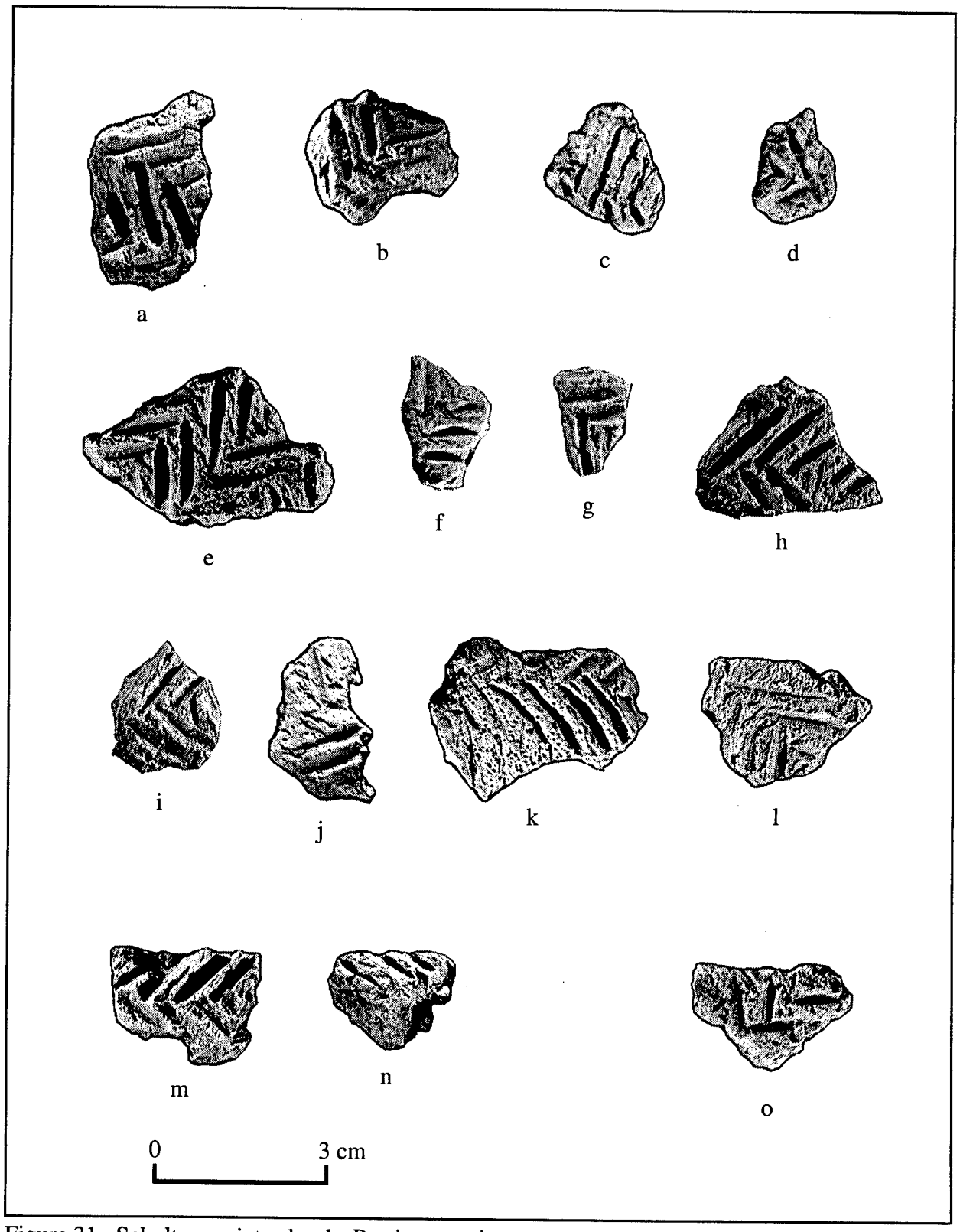


Figure 31. Schultze variety sherds, Persimmon site.

Figure 32. Schultze variety rim sherds, Persimmon site.

a. Chevron Incised, Schultze variety rims, Unit 7, levels 4 and 5

b. Chevron Incised, Schultze variety rims, Unit 7, levels 4 and 5

c. Chevron Incised, Schultze variety rims, Unit 7, levels 4 and 5

d. Chevron Incised, Schultze variety rims, Unit 7, levels 4 and 5

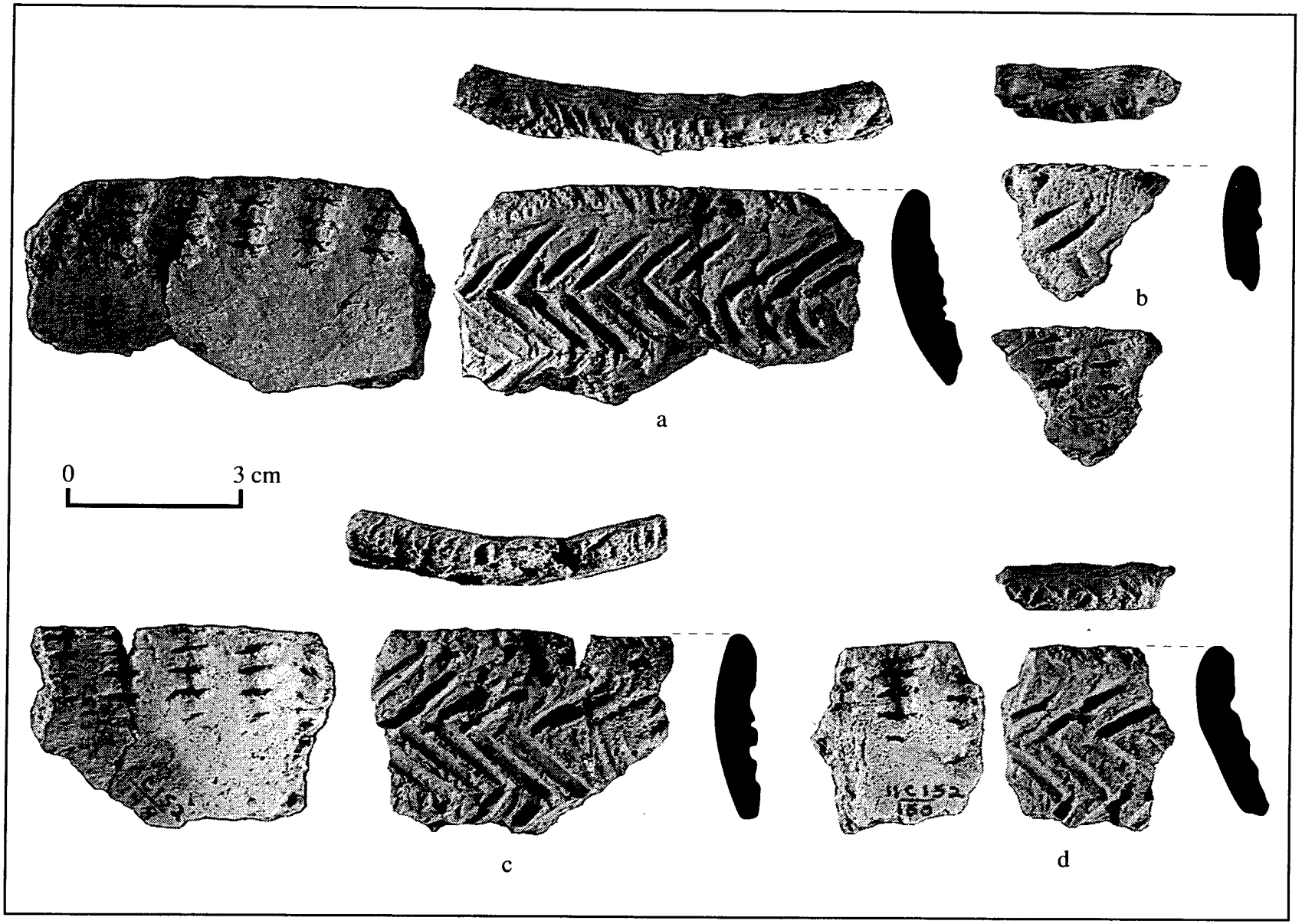


Figure 32. Schultze variety rim sherds, Persimmon site.

Figure 33. Cypress and Villegas variety sherds, Persimmon site.

a. Cordmarked, Villegas variety, Unit 8, level 5

b. Cordmarked, Villegas variety, Unit 9, level 3

c. Parallel Incised, Cypress variety, Unit 10, level 4

d. Fingernail Impressed, Cypress variety, Unit 10, level 5

e. (type indeterminate), Cypress variety rim, Unit 10, level 5

f. Fingernail Impressed, Cypress variety, Unit 10, level 5

g. Cordmarked, Cypress variety, Unit 10, level 5

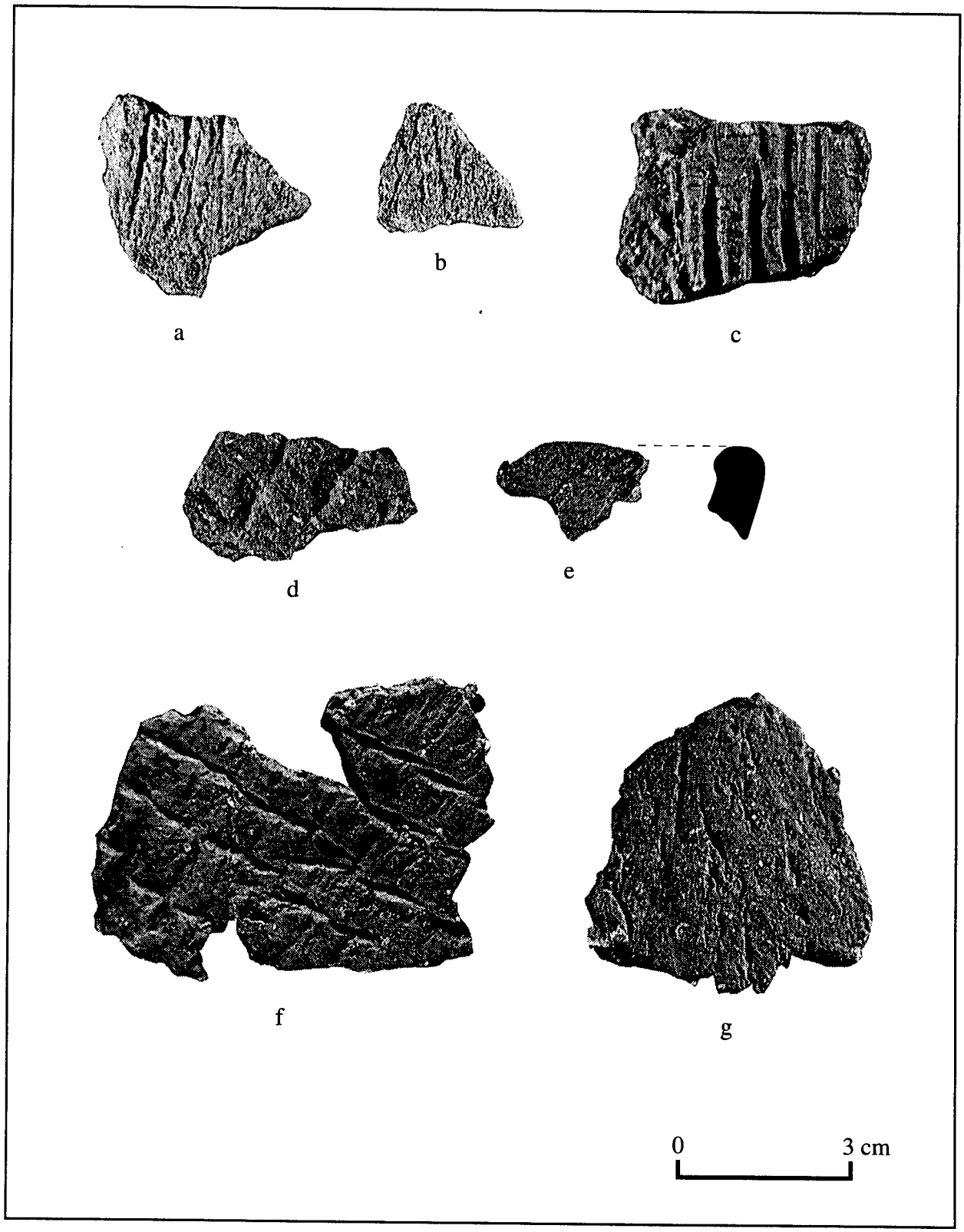


Figure 33. Cypress and Villegas variety sherds, Persimmon site.

Figure 34. Cypress and Villegas variety, and Havana series sherds, Persimmon site.

a. Incised (pattern indeterminate), Cypress variety, North Stripping Block

b. Cordmarked, Villegas variety, North Stripping Block

c. Hemiconical Punctate, South Stripping Block

d. Havana Cordmarked, South Stripping Block

e. Parallel Incised, Cypress variety (with plain dow impressed rim), Unit 20N/20W, level 1

f. Incised (pattern indeterminate), Villegas variety, Unit 10S/20W, level 5

g. (type indeterminate), Cypress variety rim, Unit 20S/30W, level 2

h. Incised (pattern indeterminate), Cypress variety, Unit 40W/0N, level 2

i. Rectilinear Incised, Cypress variety, Unit 40W/10N, level 3

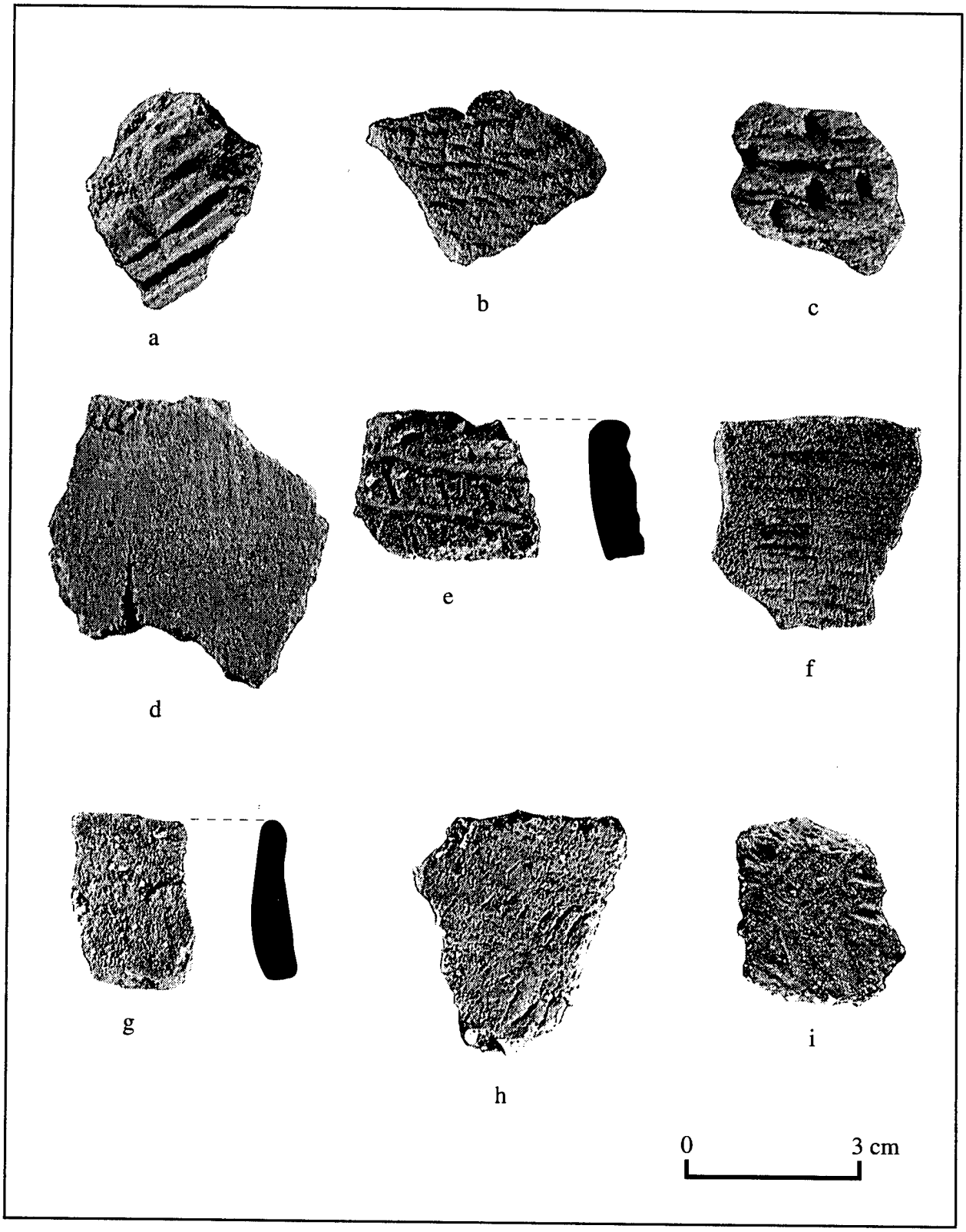


Figure 34. Cypress and Villegas variety, and Havana series sherds, Persimmon site.

Figure 35. Prehistoric ceramic sherds, Feature 3, Persimmon site.

a. Hemiconical Punctate (Sister Creeks), CWS impression on rim top, Feature 3

b. Hemiconical Punctate, Feature 3

c. Havana (incised/parallel/oblique), Feature 3

d. Incised (pattern indeterminate), Schultze variety, Feature 3

e. Type Indeterminate, plain surfaced rim, Feature 3

f. Type Indeterminate, plain surfaced rim, Feature 3

g. Type Indeterminate, Feature 3

h. Type Indeterminate, plain surfaced flat rim with CWS impressed interior lip, Feature 3

i. Type Indeterminate, (noded) plain surfaced, Feature 3

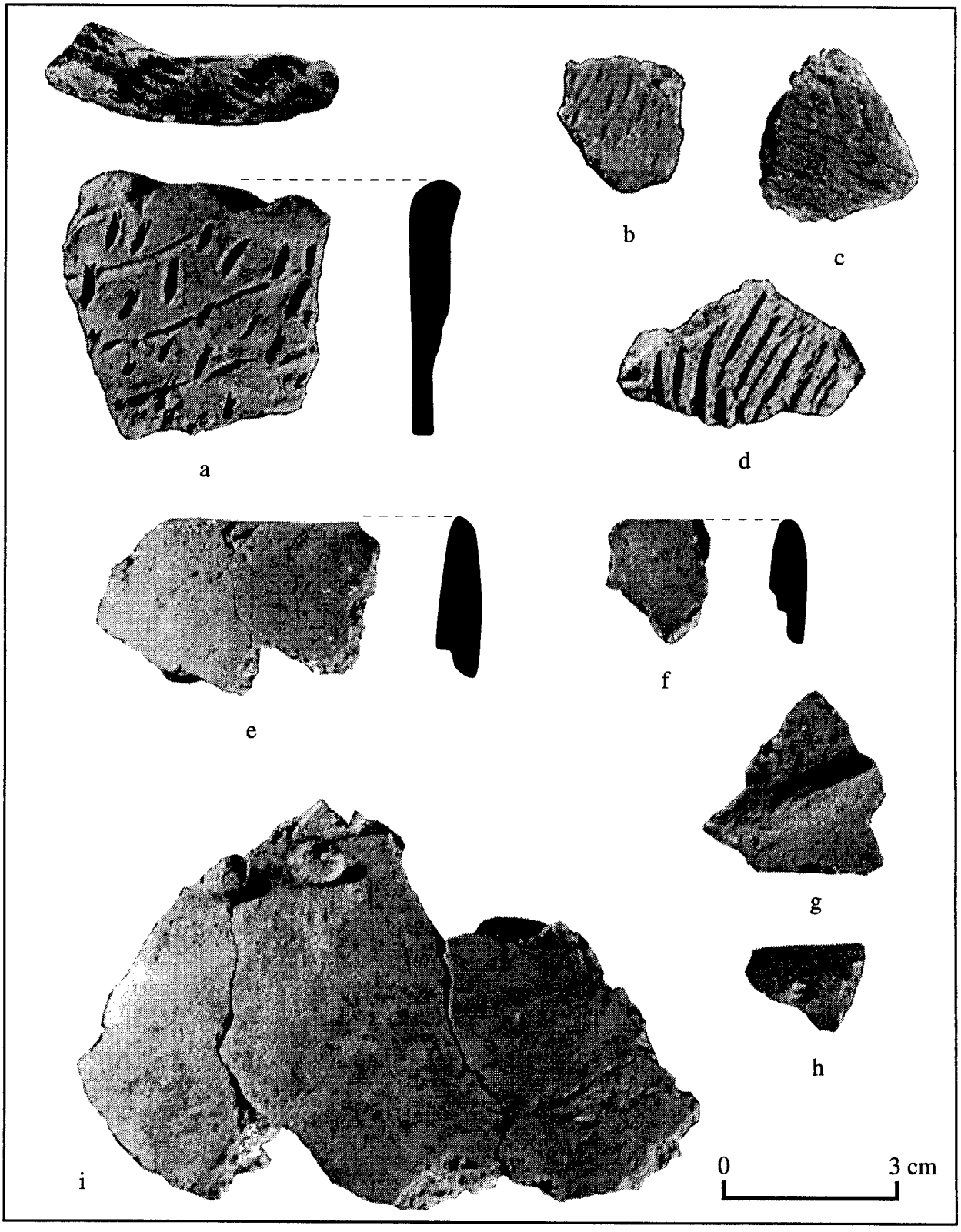


Figure 35. Prehistoric ceramic sherds, Feature 3, Persimmon site.

Figure 36. Havana series sherd, Feature 3, Persimmon site.

a. Havana (incised/parallel/oblique), flat rim (exterior)

b. (Interior) with CWS impressions on lip

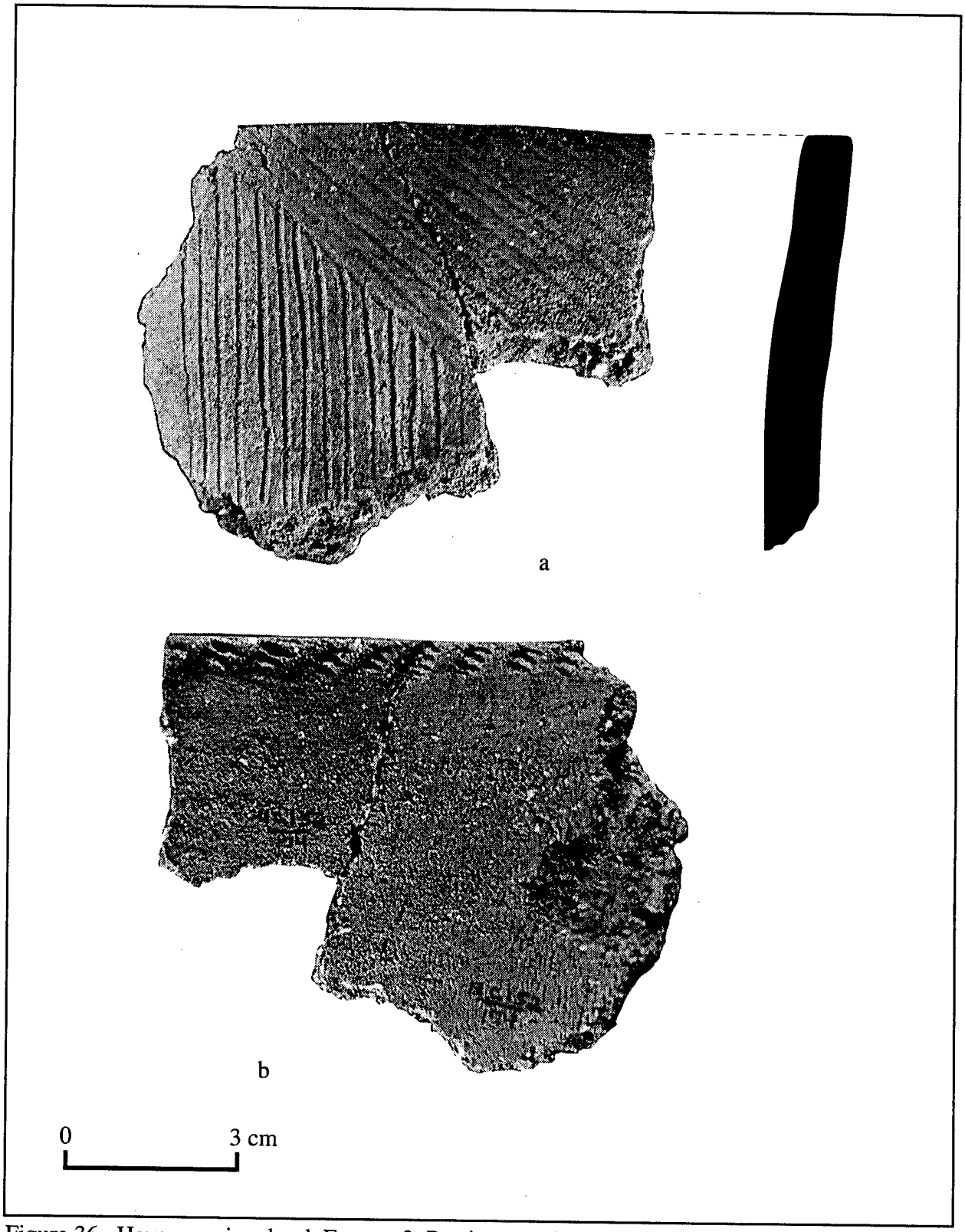


Figure 36. Havana series sherd, Feature 3, Persimmon site.

Figure 37. Schultze variety and Havana series sherds, Persimmon site.

a. Cordmarked, Schultze variety, Feature 1

b. Havana Cordmarked, Feature 3

c. Havana Cordmarked, Feature 3

d. Havana Cordmarked, Feature 3

e. Havana Cordmarked, Feature 3

f. Havana Cordmarked, Feature 3

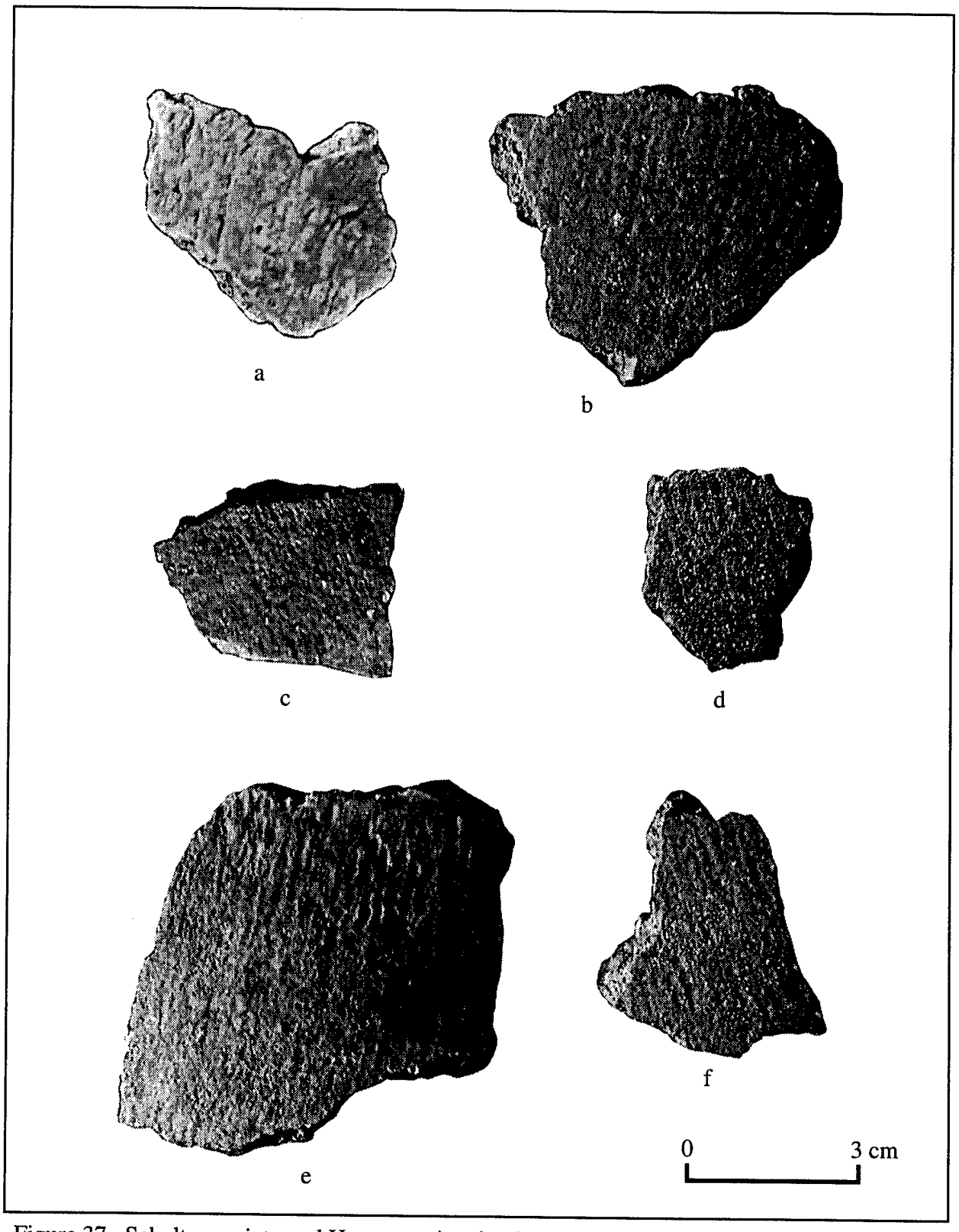


Figure 37. Schultze variety and Havana series sherds, Feature 3, Persimmon site.

CHAPTER VI. LITHIC ANALYSIS

Steve Titus

Introduction

The lithic materials analyzed for this study were recovered in the course of Phase III excavations at the Persimmon site. These artifacts were analyzed according to material, manufacture, and function in order to determine the types of chert used at the site, the kinds of chipped-stone manufacturing technologies the site occupants emphasized, and the range of activities that occurred at the site. The data generated from this analysis are used to identify the lithic-procurement and tool-production strategies evident at the site. The information these strategies provide concerning settlement mobility is discussed in the concluding section of the chapter.

Research Perspective

Recent studies suggest that variations in lithic assemblages are most amenable to behavioral interpretation when analyzed in terms of the factors influencing the organization of lithic technology (Binford 1979; Wiant and Hassen 1985). The analytical perspective of these studies is distinguished by three major premises: 1) tool production systems comprise the interconnected activities of raw material procurement, tool design, production, use, maintenance, discard, and replacement (Collins 1975; Binford 1979); 2) different tool production systems represent alternative strategies for responding to the problems posed by spatial and temporal incongruities in the distribution of lithic and biotic resources (Goodyear 1979; Wiant and Hassen 1985; Parry and Kelly 1987); and 3) tool production strategies are structured for effective integration with settlement strategies (Binford 1979, 1980). This perspective provides a theoretical basis for identifying the conditions under which the inherent advantages and disadvantages of a particular tool production strategy, relative to other production strategies, would be of sufficient importance to favor its use over other strategies.

Sample

The study collection consists of all lithic materials collected from test units, features, and mechanically stripped surfaces during excavations at the Persimmon site. The distribution of these materials is presented by artifact category and general excavation provenience in Table 6. The

Table 6. Lithic tools and debris by general provenience, the Persimmon site.

Provenience	1m x 2m test units	.5m x .5m test units (terrace)	.5m x .5m test units (escarpment)	Feature 1	Feature 2	Feature 3	Stripping
Projectile points/hafted knives	4	1	1	1			1
Unspecified bifaces	4	2					1
Informal flake tools	7		1				8
Formal flake tools	1	1	1			1	2
Amorphous cores	3	1	2				8
Blanks	1						2
Primary decortication flakes	60	6	11	3		1	1
Secondary decortication flakes	52	5	7				3
Tertiary flakes	313	43	49	11		8	16
Beface-1 flakes	344	35	24	2		6	11
Biface-2 flakes	944	109	42	16		12	
Shatter	1718	105	107	11	1	15	17
Cracked rocks	18	2	10			1	
Cobbles	2						
Pitted Stones							1
Totals	3471	310	255	44	1	44	71

lithic materials consist predominantly of artifacts recovered from the intact cultural deposit present at the site. Most of these artifacts were recovered in test units excavated on the terrace, but a small number were found in features and on stripped surfaces excavated in this portion of the site. The remainder of the assemblage consists of redeposited artifacts recovered in test units excavated on the terrace escarpment. Although these artifacts were found in a disturbed context, they are inferred to have originated in the intact deposit present on the terrace.

Ceramic data indicate the Persimmon site contains Early, Middle, and Late Woodland period occupations, and that the deposits associated with these components are to some extent mixed. The relative frequencies of sherds diagnostic of these components indicate, however, that the major occupation at the site dates to the Early Woodland period, and suggests that the intact cultural deposit present in the project area is primarily associated with this component. The Persimmon site lithic materials could not be separated by component, so the assemblage was analyzed as a single unit. It appears warranted, however, to regard the study collection as essentially an Early Woodland assemblage.

Analytical Methods

Identical analytical procedures were used to inventory the lithic materials recovered during excavations on the terrace and the terrace escarpment, but the format used to present the resultant artifact data differs. All lithic materials recovered at the Persimmon site were sorted into tool and debris categories, and were then counted and weighed. The artifact data resulting from this initial inventory are presented by test unit and excavation level, feature, and mechanical stripping block provenience in Appendix C, Tables 1-5. Following the initial inventory, all chipped-stone artifacts were sorted into chert type categories, and were again counted and weighed. The chert type identification data derived from the analysis of artifacts recovered during excavation on the terrace are presented by test unit and excavation level, feature, and mechanical stripping block in Appendix C, Tables 6-9. The chert type identification data derived from the analysis of redeposited artifacts recovered in test units excavated on the terrace escarpment were subsequently combined, and are presented in Appendix C, Table 10

Technological and Functional Analysis

Observations on use wear and morphology were used to sort lithic materials into 15 different tool and debris categories. The categories are quantified by count. A 10x hand lens was used to examine the edges and surfaces of chipped-stone artifacts. Admittedly, this approach is not as precise as when high magnification is employed (e.g., Keeley 1980), but the goals of the analysis were simple: (1) separate tools from debitage, and (2) place tools into general technological and functional categories. Debitage was separated into categories on the basis of specific attributes such as amount of dorsal cortex, degree of platform faceting and lipping, flake shape and curvature, and overall size. Tool and debitage analysis was aided by prior experiments

in stone tool production and use. Materials from these experiments were on hand for comparative purposes.

The tool and debitage categories used to inventory lithic materials from the Persimmon site were adopted from a stone-tool typology developed by Koldehoff (1988). Koldehoff's categories were modified where necessary.

Cores. A core is any cobble or piece of chert from which one or more flakes have been removed but which has not been shaped into a tool or used extensively for a task other than that of a nucleus from which flakes have been struck. Cores range from chert cobbles or chunks that have had one or more flakes removed in a random fashion (amorphous cores) to highly formalized prepared cores that produce standardized flakes (conical or blade cores). Tested cobbles are also placed in this category; these artifacts are raw pieces of chert that have had one or two flakes removed to test the knapping quality of chert.

Primary and Secondary Decortication Flakes. The amount of cortex is the distinguishing characteristic of these categories. Flakes and sizable flake fragments with greater than 50% dorsal cortex were placed within the primary decortication category, and those with 25-50% dorsal cortex were classified as secondary decortication flakes. Primary and secondary decortication flakes represent the first series of flakes detached from a nodule or cobble.

Tertiary Flakes. Flakes within this category possess no more than 25% dorsal cortex and do not exhibit attributes typical of biface thinning and retouching (resharpening) flakes. Tertiary flakes tend to be larger and more flattened in curvature than biface flakes, and they generally have irregularly shaped platforms with less than four facets. Tertiary flakes are by-products of the early stages of biface reduction as well as by-products of simple flake-tool production.

Biface Thinning and Retouching Flakes. Flakes in these categories exhibit attributes indicating their removal during the later stages of biface production (Biface-1 flakes) or during biface maintenance (Biface-2 flakes). Biface flakes possess platforms with an elliptical shape, multiple facets (four or more), lipping, and acute angles. The platforms are minute sections of what was the edge of the biface. Biface-1 flakes are substantially larger and more curved than biface-2 flakes.

Broken Flakes. Flake sections that cannot be readily identified as one of the above flake types were considered broken flakes. Flakes may be broken during any stage of reduction or by post-depositional factors such as trampling.

Angular Fragments. Chert fragments within this category include angular chunks and small splinters. These fragments are produced during stone tool manufacture, particularly if (1) poor quality (e.g., internally fractured) chert is used, (2) bipolar reduction is employed, and (3) lithic items are intensively reworked or recycled.

Thermal Shatter. Chert fragments and flake sections that exhibit heat-crazing, pot-lidding, or discoloration resulting from burning are placed in this category. Thermal shatter may result from either intentional heat treating or burning.

Informal Flake Tools. Flakes placed within this category functioned primarily as cutting and lightweight scraping tools with little to no prior modification. They are expedient flake-tools made from tertiary flakes, other flake types, as well as shatter.

Formal Flake Tools. Included within this category are all formalized and specialized flake tools--endscrapers, sidescrapers, gravers, perforators, and notches or spokeshaves. Depending upon degree of modification, some of these tools could be considered expedient flake-tools, but they are placed here because they are more specialized in their morphology (and inferred function) than the simple flake knives and scrapers in the previous category.

Blanks/Preforms. A biface can be defined as a flake or cobble that has had multiple flakes removed from dorsal and ventral surfaces. Bilateral symmetry and a lenticular cross-section are common attributes; however, these attributes vary with the stages of production, as do thickness and uniformity of the edge. Included in this category are unfinished hafted bifaces. This category was divided into two subcategories:

Blanks. Unfinished hafted bifaces placed in this category are thick (relative to preforms), bilaterally asymmetrical, lack a lenticular cross-section, have irregular, sinuous edges, and frequently have small amounts of cortex remaining on edges and faces. Blanks are produced during early to intermediate stage biface production.

Preforms. Unfinished hafted bifaces placed in this category exhibit the attributes that are characteristic of finished hafted bifaces, but lack a hafting element. Preforms are produced during late stage biface production.

Projectile Points/Hafted Knives. These formal tools were predominantly designed to be hafted, and they functioned as projectile points and/or knives. Included in this category are hafted bifaces that were recycled into hafted scrapers. Points were assigned to previously-defined point types when sufficiently intact to allow classification. The point type descriptions used to classify points were obtained primarily from Justice (1987).

Unspecified Bifaces. Nondiagnostic fragments of bifacial flaked tools were placed in this category, for example, distal tips and midsections of projectile points.

Cracked Rock. Cracked rocks are fragments of sandstone bedrock or glacial cobbles of igneous/metamorphic rock that were fractured due to repeated exposure to thermal extremes. These rocks may have functioned as hearth stones or agents of heat retention in culinary activities such as stone boiling or steaming.

Pitted Limestone. Slabs of limestone, or glacial cobbles, exhibiting pitted surfaces are commonly referred to as nutting stones, and are interpreted as having been used during nut processing.

Chert Type Analysis

Chert type identification was based upon macroscopic inspection of artifacts in conjunction with an extensive comparative collection of geologic samples collected from source areas (Koldehoff 1986). Chipped-stone artifacts were sorted into seven categories (discussed below) on the basis of color, texture, inclusions, and form. Six of these categories represent chert types recognized during analysis. The seventh category, designated Indeterminate, includes unusual variants that could not be duplicated in the comparative collection, and those that could not be identified because of thermal damage. Chert types were quantified by count and weight, with weights rounded to the nearest 0.1 of a gram. Chert type descriptions are presented below.

Burlington. Burlington chert is derived from the Burlington Limestone of the Lower Valmeyeran Series of the Mississippian System. The Burlington Formation is rich in chert and is widely exposed along both sides of the Illinois Valley 3-6 miles north of the Persimmon site (Figure 38). Burlington chert, on average, is medium- to high-quality, white to light gray in color, and occurs as residuum and as bedded layers in limestone.

Chouteau. Chouteau chert derives from the Chouteau Limestone Formation of the Upper Kinderhookian Series of the Mississippian System. The Chouteau Formation is exposed along both sides of the Illinois Valley 3-6 miles north of the Persimmon site (Figure 38). Chouteau chert is a medium- to high-quality chert that ranges in color from black to dark gray and contains numerous microfossils (Meyers 1970:10).

Cobden/Dongola. Cobden/Dongola chert originates in the St. Louis Limestone Formation of the Upper Valmeyeran Series of the Mississippian System. This high quality nodular chert is dark to light gray, has a smooth texture free of inclusions, and frequently exhibits concentric banding. The two known source areas for Cobden/Dongola are along Clear Creek and Big Creek in Union County, Illinois, approximately 125 miles southeast of the Persimmon site. Cobden/ Dongola chert is referred to as Cobden in this analysis.

Fossiliferous Kinkaid. The Kinkaid Limestone is the parent formation of Kinkaid chert, and it has numerous exposures in the Shawnee Hills of southern Illinois. The fossiliferous variety of this chert is more common than the nonfossiliferous variety, and it is of moderate knapping quality because of its grainy texture and fossil inclusions. Fossiliferous Kinkaid chert is usually light brown or light blue, and occurs as residual blocks or as bedded lenses in the Kinkaid Limestone. The source area for fossiliferous Kinkaid chert located nearest the Persimmon site occurs in the headwaters of Kinkaid Creek in southeastern Randolph County, approximately 90 miles southeast of the Persimmon site.

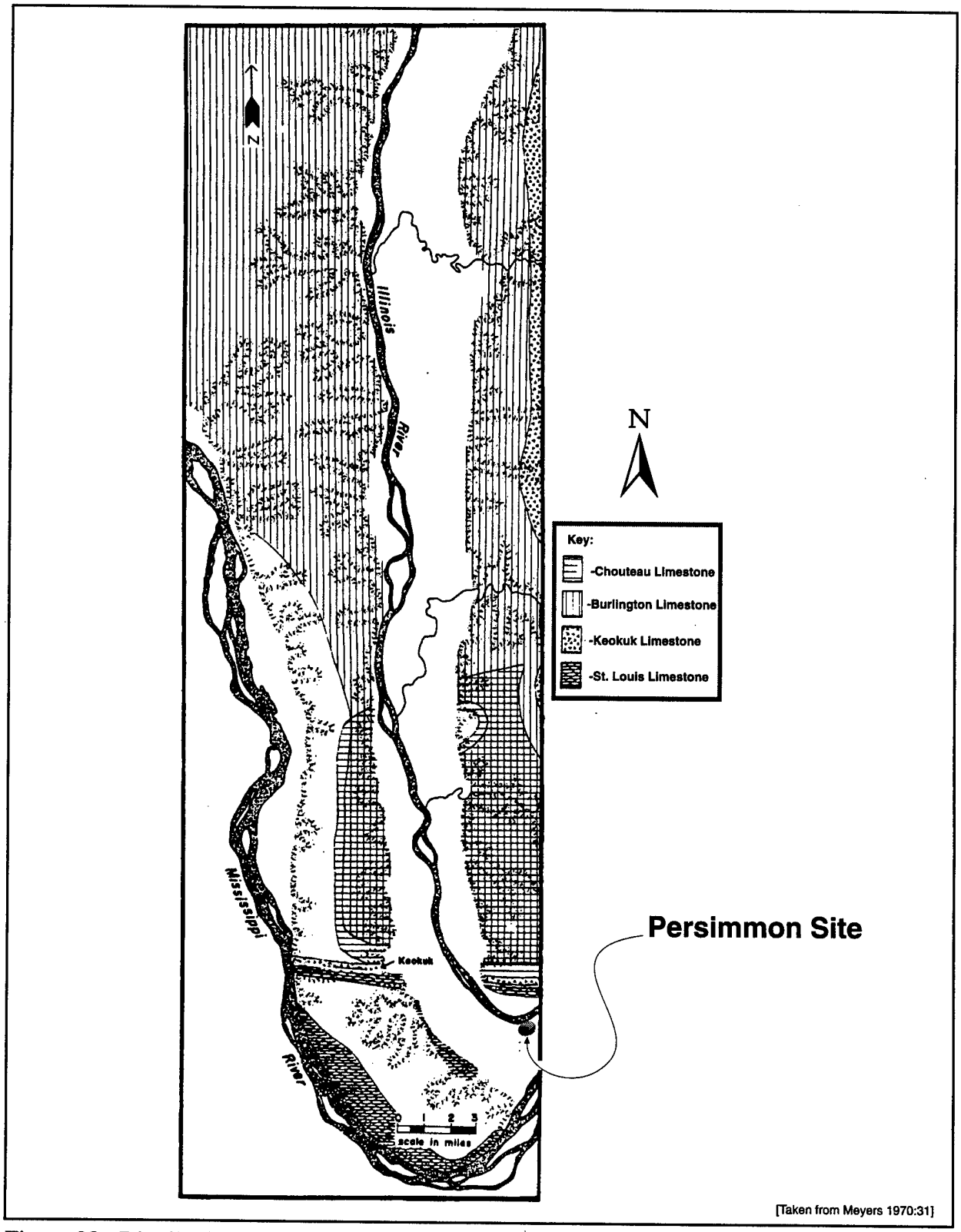


Figure 38. Distribution of the four major chert-bearing bedrock formations in the lower Illinois River Valley.

Kaolin. As it occurs entirely as residuum, the parent formation of Kaolin chert is unknown. Its main source area is along Iron Mountain on Clear Creek in Union County, Illinois, approximately 125 miles southeast of the Persimmon site. The knapping quality of Kaolin chert is variable, as is its color. Most pieces of Kaolin chert display some degree of translucency, with common colors ranging from white to brown to red. High quality Kaolin chert is fine-grained and lustrous in appearance. Kaolin chert occurs as large slabs and boulders.

Ste. Genevieve. Ste. Genevieve chert is derived from the Ste. Genevieve Limestone Formation of the Upper Valmeyeran Series of the Mississippian System. The Ste. Genevieve Formation outcrops in southern St. Clair, western Monroe, and northern Randolph counties in Illinois (Koldehoff 1985:44), approximately 40-65 miles southeast of the Persimmon site. Ste. Genevieve chert occurs as small nodules and in bedded lenses, and ranges in color from light brown and red to light gray and blue. The nodular form is nonfossiliferous, has a smooth texture, and is commonly lustrous in appearance, while the bedded form is fossiliferous and has a grainy texture (Koldehoff 1985).

Unidentified. Artifacts placed in this category include unusual variants that could not be duplicated in the comparative collection.

Chipped-Stone Manufacturing Technologies

The overwhelming majority (99%) of the artifacts in the lithic assemblage consist of chipped-stone tools and debitage. One of the objectives of this study is to determine the relative frequency of the different chipped-stone manufacturing technologies represented in the site assemblage. To accomplish this objective, each of the debitage categories was grouped with the tool and core categories with which it was inferred to have been associated. This section describes the technological groupings used to identify the manufacturing technologies represented in the site assemblage.

Technological Groupings

Two chipped-stone manufacturing technologies were identified in the lithic assemblage: biface technology, and amorphous core technology. The relative frequencies of these technologies were determined following the procedure used by Morrow (1988). This procedure involves grouping the debitage and tool categories associated with each technology. Artifacts that had previously been identified as informal or formal flake tools were reexamined, and then placed in the appropriate debitage category. This procedure produced the following technological groupings:

Biface Technology. Biface thinning and resharpening flakes, biface blanks/preforms, unspecified bifaces, and projectile points/hafted knives are regarded as indicating the presence of biface technology.

Amorphous Core Technology. Primary and secondary decortication flakes, tertiary flakes, and amorphous cores are regarded as indicating the presence of amorphous core technology.

While the various tools and cores can be unequivocally assigned to technological categories, debitage poses particular problems. Because chipped stone manufacturing technologies overlap, especially in the early stages of tool production, it is not possible accurately to assign every flake to a specific technology. Indeed, the technological groupings used in this study are likely to produce an exaggerated estimate of the relative frequency of amorphous core technology, while underestimating the relative frequency of biface manufacture. The source of this problem is that decortication and secondary flakes are common by-products of early stage biface reduction, but have been assigned to the amorphous core technological group. The reasons for regarding these categories of debitage as indicative of amorphous core technology, rather than biface technology, are examined below.

As previously noted, decortication and tertiary flakes are most commonly generated during the early stage of biface reduction. However, the chipped stone samples contain little evidence of early-stage biface reduction. No more than 7% of the debitage in the sample consists of decortication flakes, and only a small proportion of the tertiary flakes consist of flakes that have any amount of cortex on their dorsal surfaces. If early-stage biface reduction had been a frequent activity at the site, a larger proportion of the debitage in the sample would be expected to consist of cortex-covered flakes. Moreover, most of the unfinished hafted bifaces in the sample are mid-stage to late-stage bifaces, i.e., most are classifiable as "thin blanks." These characteristics of the chipped-stone sample suggest that initial thinning and shaping of bifaces was completed before the tools were brought to the site, and that biface manufacture at the Persimmon site consisted of mid-stage to late-stage reduction. Consequently, it appears likely that most of the decortication and tertiary flakes in the sample result from amorphous core technology. Accordingly, these flake categories are assigned to the amorphous core group.

It is unlikely that the proportion of each sample attributable to a specific technology can be precisely determined with the technological groupings used in this study, but the amount of error is expected to be minimal.

Chipped-Stone Inventory

This section presents the Persimmon site chipped-stone data. Data concerning chert use are presented first, followed by those pertaining to manufacturing technologies.

Chert Use

Table 7 presents summary chert type frequency data for the Persimmon site study collection. Burlington chert dominates the collection, accounting for approximately 86% of the sample by count and 90% by weight. Chouteau chert is the second most frequently occurring chert

Table 7. Summary chert type frequency data for the Persimmon site (11-C-152).

Chert Type	Total #	Weight	Frequency #	Wt.
Burlington	3,607	2,923.4	85.7%	90.1%
Chouteau	285	197.1	6.8%	6.1%
Kaolin	193	53.1	4.6%	1.6%
Cobden	98	30.0	2.3%	0.9%
Ste. Genevieve	9	2.0	0.2%	0.1%
Fossiliferous Kinkaid	4	5.4	0.1%	0.2%
Unidentified	12	35.1	0.3%	1.1%
Totals	4,208	3,246.1	100.0%	100.0%

type, representing approximately 7% of the sample by count and 6% by weight. Kaolin and Cobden chert are marginally represented in the collection, together accounting for approximately 7% of the collection by count and less than 3% by weight. Ste. Genevieve and Fossiliferous Kinkaid are rare, together accounting for less than 1% of the sample by count and slightly more than 1% by weight. Twelve pieces of chipped stone were relegated to the Unidentified category. This category represents less than 1% of the collection by count and slightly more than 1% by weight.

Technological Use

The study collection contains evidence of biface, amorphous core, and prepared core technologies.

Biface Technology. Biface thinning flakes (biface-1), biface resharpening flakes (biface-2), projectile points/knives, unspecified bifaces, and biface blanks represent this technology in the study collection (Table 8). Biface thinning and resharpening flakes primarily consist of Burlington chert, but each of the other chert types identified in the collection are also represented. All of the biface blanks, unspecified bifaces, and projectile points/hafted knives were manufactured from Burlington chert.

Amorphous Core Technology. Evidence of this technology consists of the presence of amorphous cores, primary and secondary decortication flakes, and tertiary flakes (Table 8). Burlington, Chouteau, Kaolin, Cobden, and Fossiliferous Kinkaid chert represent the chert types identified among the flakes placed in this technological group. The 14 amorphous cores in the collection represent Burlington chert.

Tool Production

The sample contains 18 formal tools, including 8 finished bifaces (projectile points/knives), 3 unfinished bifaces (blanks), and 7 unspecified bifaces that were too fragmentary to permit more specific technological/functional identification (Table 8).

Eight of the projectile points/knives are fragmentary, but one is complete enough to be temporally diagnostic (Figure 39d). The diagnostic point is classified as a Belknap point. Points of the Belknap type cluster are diagnostic of Early Woodland Black Sand culture occupations (Farnsworth and Asch 1986). The Belknap point in the study collection is made from Burlington chert, and was found during mechanical stripping in the South Stripping Block. The seven projectile point/knife fragments are made from Burlington chert.

The unfinished bifaces in the collection consist of 3 blank fragments. Two of the blank fragments are intermediate-stage blanks that have square and/or sinuous edges and exhibit medium to large flake scars (Figure 39b-c), while the third is a late stage blank (Figure 39a). All of the unfinished bifaces are made from Burlington chert.

Twenty-three chipped stone pieces exhibit unifacial retouch. Seventeen pieces of chipped stone, including 1 primary decortication flake, 2 secondary decortication flakes, 6 tertiary flakes, 5 biface-1 flakes, 2 shatter, and 1 core fragment, are classifiable as informal flake tools. Six of the informal flake tools exhibit steep edge-retouch, suggesting they were used as scrapers, and the remainder appear to have been used as knives. Fourteen of the informal flake tools are made from Burlington chert (Figure 40d), 1 is made of Kaolin chert, 1 from Cobden chert, and 1 from Ste. Genevieve chert. Six chipped stone pieces, including 1 primary decortication flake, 2 tertiary flakes, and 3 shatter, are classifiable as formal flake tools. One of the formal flake tools is a circular ("humpback") scraper (Figure 40a), 1 is a distolateral scraper (Figure 40b), 1 is an endscraper (Figure 40c), and 3 are perforators (Figure 40e-g). One of the formal flake tools, a distolateral scraper, is made from Fossiliferous Kinkaid chert, and all of the others are made from Burlington chert.

Lithic-Procurement Strategy

The chert utilization pattern evident in the Persimmon site lithic assemblage generally conforms to the pattern previous research has identified at Black Sand Cypress phase sites in the Illinois River Valley, although it appears to differ from the regional pattern in one minor, but potentially significant, respect. Burlington chert dominates the study collection, accounting for nearly 86% of the sample by count and 90% by weight (Table 7). This high-quality, locally available chert was favored over all chert types for the manufacture of both bifaces and expedient flake tools, accounting for 100% of all bifacial tool forms and amorphous cores, as well as the overwhelming majority of all debitage categories. The other locally available chert type represented in the collection, Chouteau chert, accounts for a much smaller proportion of the

Figure 39. Selected bifaces, Persimmon site.

a. Blank fragment, Burlington chert, Unit 8, level 5

b. Blank fragment, Burlington chert, North Stripping Block

c. Blank fragment, Burlington chert, South Stripping Block

d. Belknap point, Burlington chert, South Stripping Trench

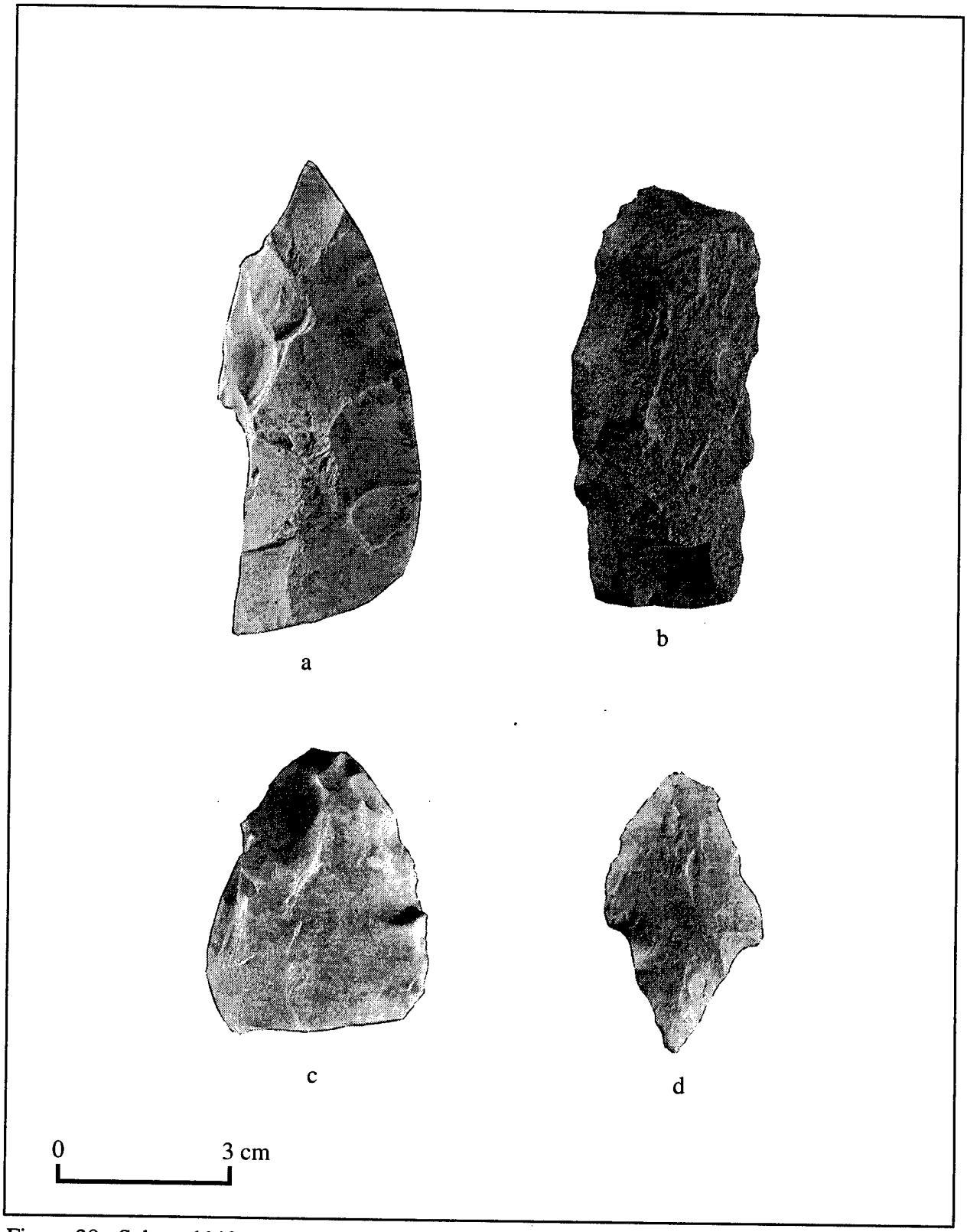


Figure 39. Selected bifaces, Persimmon site.

Table 8. Technological types by chert types at the Persimmon site - all proveniences combined.

Chert type	Burlington	Chouteau	Kaolin	Cobden	Ste.Genevieve	Fossiliferous Kinkaid	Unidentified	Total
Biface Technology								
Biface-1 flake	374	20	9	16	3	1		423
Biface-2 flake	971	54	58	34	1	1		1119
Blanks	3							3
Projectile points/knives	8							8
Unspecified bifaces	7							7
Subtotal	1363	74	67	50	4	2		1560
Amorphous Core								
Primary decortication	58	14	1				9	82
Secondary decortication	42	22	3	1				68
Tertiary flakes	377	35	22	5		1		440
Amorphous cores	16							16
Subtotal	493	71	26	6	0	1	9	606
Total	1856	145	93	56	4	3	9	2166
+Shatter	1751	140	100	42	5	1	3	2042
Grand Total	3607	285	193	98	9	4	12	4208
Overall Frequency	86%	7%	5%	2%	0.2%	0.1%	0.3%	100%

chipped-stone collection compared with Burlington chert. This is somewhat surprising, considering that high-quality samples of Chouteau chert can be found within 6 miles of the Persimmon site (Tony Hughes, personal communication). One possible explanation for the magnitude of the disparity in the frequencies of Chouteau and Burlington chert represented in the study collection is that the size and/or the form in which Chouteau chert occurs in the Persimmon site vicinity made it unsuitable for manufacturing bifaces, and was less attractive than the readily available Burlington chert for manufacturing flake tools. The fact that a substantially larger percentage of the Chouteau chert sample (49%) than the Burlington chert sample (27%) is associated with amorphous core technology (Table 8) suggests that Chouteau chert was not, in fact, especially suitable for manufacturing bifaces, but was used for this purpose, or for making expedient flake tools, whenever a sufficiently large nodule happened to be found.

Four nonlocal chert types, Kaolin, Cobden, Ste. Genevieve, and Fossiliferous Kinkaid chert, also were identified in the study collection. While none of these chert types is well represented in the sample, it is noteworthy that Kaolin and Cobden chert, which originate approximately 125 miles southeast of the Persimmon site, together account for a larger proportion of the collection than does Chouteau chert (Table 7). While Cobden and Kaolin chert were widely traded throughout the Midwest during certain cultural periods, especially the Middle Woodland and Mississippian periods (Winters 1981, 1984), previous research in the lower Illinois Valley indicates that Black Sand Cypress phase sites seldom contain nonlocal chert (Farnsworth and Asch 1986:407). It is possible, then, that the Kaolin and Cobden chert represented in the collection are associated with the Middle or Late Woodland components present at the site, although the distribution of these chert types at the Persimmon site makes this appear unlikely. First, less than half (47%) of the Kaolin and Cobden chert in the collection was recovered in test units yielding Middle and/or Late Woodland ceramics, and, second, both of these chert types were recovered in Feature 1, which contained only Early Woodland Black Sand diagnostics. Feature 1 also yielded five biface resharpening flakes made from a translucent, smokey black chert of an unidentified type, thus providing additional evidence of the use of nonlocal chert by the Black Sand groups occupying the Persimmon site.

The chert type frequency pattern identified in the study collection indicates the Black Sand occupants of the Persimmon site satisfied their tool-making needs through a heavy reliance on Burlington chert, a high-quality chert that occurs in abundance within a few miles of the site. Burlington chert may occasionally have been obtained through direct procurement trips made to specific source areas for the express purpose of obtaining this chert, but it is so widely occurring in the vicinity that its procurement is more likely to have been scheduled into the hunting and gathering forays of the site occupants. The composition of the study collection indicates that the site occupants' reliance on Burlington chert was complemented by use of a second locally occurring chert, Chouteau chert. For some undetermined reason, however, Chouteau chert was used much less intensively than Burlington chert. It is possible that the favored source areas for the generally preferred Burlington chert simply did not contain abundant quantities of Chouteau chert of a satisfactory size or quality, and, consequently, was collected only when a suitable piece of the material happened to be found.

Figure 40. Selected flake tools, Persimmon site.

a. Humpback scraper, Burlington chert, South Stripping Block

b. Distolateral scraper, Fossiliferous Kinkaid chert, Unit 4I (N10 W20), level 2

c. Endscraper, Burlington chert, South Stripping Block

d. Informal flake tool, Burlington chert, South Stripping Block

e. Perforator, Burlington chert, Feature 3

f. Perforator, Burlington chert, Unit 1I (N10 W50), level 1

g. Perforator, Burlington chert, Unit 6, level 1

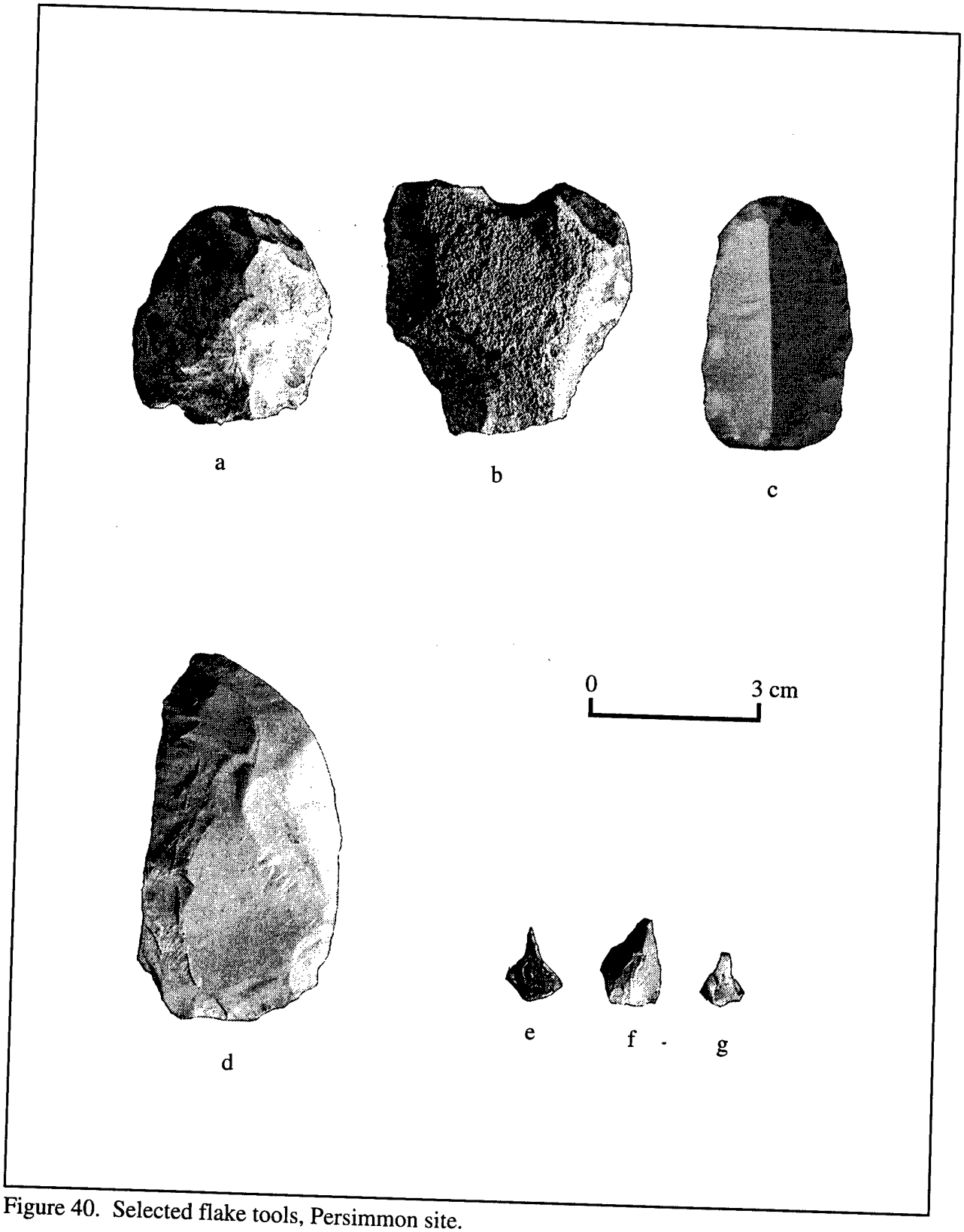


Figure 40. Selected flake tools, Persimmon site.

Because of the wide availability of Burlington chert in the lower Illinois Valley and adjacent regions, the Persimmon site lithic assemblage provides little evidence of the site occupants' patterns of seasonal movement or their contact with groups outside the region. The study collection does indicate, however, that the groups occupying the site were obtaining small amounts of nonlocal chert through either trade or procurement. The virtual absence of nonlocal chert at previously investigated Black Sand Cypress phase sites in the central Illinois Valley has been cited as evidence of the groups of that region not having been engaged in long-distance trade (Munson 1986:296), and the almost exclusive reliance on local (Burlington) chert at Cypress phase sites in the lower Illinois Valley has been interpreted as evidence that the Black Sand settlement-subsistence pattern did not involve wide-ranging seasonal movements between distant regions (Farnsworth and Asch 1986:407). While the study collection certainly provides no evidence of the Persimmon site occupants having been linked through a formalized exchange network with groups of other regions, or of seasonal movements between the lower Illinois Valley and regions to the south, the sample does suggest some degree of contact with more southern groups.

The Early Woodland Florence series ceramics found at a few Black Sand Cypress phase sites in the southern portion of the lower Illinois Valley have been interpreted as either representing trade vessels originating at Florence phase sites in the American Bottom, or as indicating some level of social interaction with Florence phase groups (Farnsworth and Asch 1986:356-357). The type site for Florence series ceramics, the Florence Street site, is located within the central portion of the American Bottom, in western St. Clair County, Illinois. Source areas of Ste. Genevieve chert, one of the nonlocal chert types represented in the Persimmon site assemblage, occur in southern St. Clair County, Illinois, in the general vicinity of the Florence Street site. Consequently, it appears reasonable to view the Florence phase groups of the American bottom as the likely source of the Ste. Genevieve chert contained in the study collection, and, perhaps through contact with yet more southern groups, of the Kinkaid, Kaolin, and Cobden chert in the sample as well. Although it can not be determined with the available data, the mechanism through which these nonlocal cherts traveled appears more likely to have involved hand-to-hand, down-the-line trade with groups of the northern American Bottom, rather than direct exchange with the more southern groups, in view of the small quantities in which these chert types occur in the Persimmon site assemblage.

Tool-Production Strategy

The study collection contains evidence of two chipped-stone manufacturing technologies--biface technology and amorphous core technology (Table 8). Biface technology is much better represented in the collection than amorphous core technology, accounting for about 72% of the chipped-stone artifacts in the sample that were assignable to a specific technology. Amorphous core technology accounts for the balance of the chipped stone assignable to a specific technology, representing approximately 28% of the classifiable items. The complete absence of evidence of prepared core technology, either in the form of blades or blade cores, is noteworthy considering

the prevalence of this technology at Middle Woodland sites in the region (Farnsworth and Asch 1986:407).

Biface technology at the Persimmon site involved the manufacture, maintenance, and repair of small projectile points/hafted knives. No evidence of the manufacture or repair of large bifacial digging tools or wood-working tools was identified in the collection. The composition of the tool assemblage and the relative frequencies of associated debitage categories suggest that biface technology at the Persimmon site emphasized the maintenance and repair of bifaces, late-stage biface manufacture being of secondary importance (Table 8). The study collection contains little evidence of early- or intermediate-stage biface production, suggesting that most initial biface reduction was carried out at chert source areas.

Burlington chert dominates the tool and debitage collection associated with biface technology to a slightly greater degree than it does the chipped-stone assemblage as a whole, while Chouteau chert is not quite as well represented in this technological grouping as it is overall. A larger percentage of each of the other chert types represented by items assignable to a specific technology are associated with biface technology rather than amorphous core technology (Table 8). This pattern simply reflects the fact that the majority of the artifacts assignable to a specific technology made of Cobden and Kaolin chert, the most frequently occurring nonlocal cherts, consist of biface resharpening (biface-2) flakes. While this is also true of artifacts made of Burlington chert, it is consistent with the expected pattern for chert types of nonlocal origin.

Amorphous core technology refers to the unstructured production of flakes for use as informal, or expedient, flake tools. This technology consists simply of detaching flakes from an unprepared core and using them, with little or no prior modification, to perform cutting, scraping, or graving tasks. The flakes produced in the course of shaping and thinning a biface could be used for the same purposes that flakes produced intentionally through core technology were used, but in this analysis would be grouped with items associated with biface technology. Seventeen informal flake tools were identified in the study collection, including 6 that appear to have been used as scrapers and 11 that may have been used as knives. Five of the informal flake tools, all apparently used to perform cutting tasks, represent biface thinning (biface-1) flakes, and the remainder consist of primary and secondary decortication flakes, tertiary flakes, shatter, and an amorphous core fragment that appears to have been used as a scraper. Amorphous core technology is also represented by 14 amorphous cores (Table 8). Eight (50%) of these cores were found during mechanical stripping, reflecting a collection strategy biased toward collecting large artifacts and, thus, resulting in a core sample that does not accurately represent the frequency with which this artifact class occurs at the site.

Burlington chert dominates the collection of cores and debitage associated with amorphous core technology to a somewhat smaller extent than it does the chipped-stone assemblage as a whole, while Chouteau chert is much better represented in this technological grouping than it is overall. With the exception of Ste. Genevieve chert, each of the other chert types identified in the study collection are represented among the artifacts associated with amorphous core technology.

The majority of the utilized flakes struck from amorphous cores, and all of the cores, are made of Burlington chert.

Site Activities

The functional artifact typology used to organize the prehistoric artifact inventory data presented in Appendix C, Tables 1-10, is similar to the functional typological system used by McMillan (1971) and Ahler and McMillan (1976) to analyze the artifacts from Rogers Shelter. Originally developed by Winters (1969), this typological system facilitates inference of site function by grouping artifact classes into general behavioral categories. The activities represented in the Persimmon site lithic assemblage include stone tool production and maintenance (cores, blanks, and debitage), heating and cooking (cracked/burned rock and cobbles), hunting and general maintenance (projectile points/hafted knives, unspecified bifaces, and flake tools), fabricating and processing (perforators), and domestic processing and preparation (pitted stones).

Stone-tool production and maintenance are the dominant site activities represented in the study collection, together accounting for 98% of the lithic assemblage. The focus of the lithic reduction activities occurring at the site consisted of the maintenance and repair of projectile points/hafted knives, although late-stage biface reduction and simple flake tool manufacture occurred as well.

The lithic assemblage provides some evidence of heating and cooking activities having occurred at the site, although the artifacts indicative of these activities, cracked and/or burned rock and cobbles, occur in surprisingly small quantities. While reflecting an apparent scarceness of naturally occurring sources of these materials in the immediate vicinity of the site, the paucity of these artifacts in the study collection also suggests relatively brief occupational episodes.

Hunting and general maintenance activities are indicated by a variety of tool categories. The grouping of flake tools, both knives and scrapers, with projectile points/knives reflects the relationship between hunting and butchering, as well as the flexibility of the bifacial tool form. In addition to being used as projectiles, small hafted bifaces are inferred to have frequently functioned as knives. Bifacial knives and simple flake knives are interpreted as cutting tools used for a variety of tasks, including hunting and butchering, and flake scrapers are commonly regarded as tools suitable for hide-processing and light wood-working.

Three of the formal flake tools recognized during the present analysis can be identified as perforators. Although the material these small tools were used on is not known, these artifacts are indicative of fabricating and processing activities. Domestic activities are represented in the collection by a large pitted limestone. This artifact appears to represent a nutting stone.

A rather narrow range of site activities is reflected in the study collection, especially in view of the fact that the assemblage represents an accumulation of debris associated with multiple

occupational episodes. Two of the five general behavioral categories represented in the collection are each indicated by no more than three artifacts (fabricating and processing, and domestic processing and preparation), and two others (hunting and general maintenance, and heating and cooking) are represented by only a few dozen. This would suggest that the Persimmon site represents a series of occupations of relatively short duration.

Discussion

The chert type frequency pattern identified in the study collection indicates a heavy reliance on Burlington chert, a high-quality chert that occurs in abundance within a few miles of the site. It is likely the Black Sand occupants of the Persimmon site acquired this chert through an embedded procurement strategy involving scheduled stops at known source areas during hunting and gathering forays. Small amounts of a variety of other chert types were identified in the collection, including several nonlocal chert types that indicate the occupants of the Persimmon site interacted with groups outside the region.

The tool-production strategy evident in the Persimmon site lithic assemblage reflects an emphasis on small biface manufacture using locally available Burlington chert. The focus of lithic reduction activities occurring at the site was biface maintenance and repair. Early- to intermediate-stage biface manufacture is assumed to have been carried out at source areas located along the valley margin, as little evidence of initial reduction is contained in the site collection. Amorphous core technology is evident in the lithic assemblage, but represents a minor component in the tool-production strategy employed by the site occupants. Expedient flake tools were manufactured from a variety of chert types, but Burlington chert predominates.

A rather narrow range of site activities are evident in the Persimmon site lithic assemblage, suggesting the site represents a series of occupational episodes of relatively short duration. The small number of pit features present at the site, and the apparent absence of storage pits and structures, provide additional evidence in support of this interpretation. Ceramics are fairly abundant at the site, however, suggesting it was occupied by small residential groups rather than special activity groups.

The composition of the Persimmon site chipped-stone assemblage reflects a much greater emphasis on biface technology than amorphous core technology. This tool-production pattern represents a common response to situations where future tool-needs cannot be precisely anticipated and where sources of raw material for replacing tools occur at great distances from tool-use locations (Goodyear 1979; Parry and Kelly 1987; Morrow 1988). Situations such as these characterize subsistence strategies involving both residential mobility and logistical mobility by smaller task groups (Binford 1980).

The major disadvantage of amorphous core technology is that it is extremely wasteful of raw material and is less portable than biface technology. Despite the wide availability of

Burlington chert along the valley margins in the lower Illinois Valley, a greater reliance on amorphous core technology at the Persimmon site would have made raw material procurement more costly, both in terms of time and effort. Sedentary groups can offset the high costs of using a technology wasteful of raw material by stockpiling raw material procured through regular trips to lithic sources (Parry and Kelly 1987). Little evidence of stockpiling is evident in the study collection, however, suggesting that this option may not have been available to the Persimmon site occupants due to their subsistence-settlement strategy entailing a high degree of residential mobility.

CHAPTER VII. FAUNAL ANALYSIS

Elizabeth Scott

Introduction

The faunal assemblage from the Persimmon site (11-C-152) consists of 743 fragments of bone and shell (a total of 739 fragments when adjusted for glued/fitted bones) weighing 12.0 grams. Of these, only 108 fragments were identifiable at the level of class or lower.

Ceramics recovered from the site indicate that the primary occupation dates to the Early Woodland period, although Middle and Late Woodland ceramics were recovered in small numbers. Several contexts are considered Early Woodland (Feature 1, Stratum 2, and Stratum 3); one feature (Feature 3) is considered to be an Early-Middle Woodland transitional context; and several units contained Early, Middle, and Late Woodland ceramics (Units 3, 6, 9, 10), indicating a mixed Woodland context. The cultural affiliation of Feature 2 is not known, and Stratum 4 contexts are considered culturally sterile, with the small number of artifacts and faunal material explained by translocation due to natural processes. Each of these contexts is treated separately in the secondary data tables and in the discussion.

Methods

The faunal remains analyzed here were recovered in the field by 1/4 in. screening and flotation. They were identified using the comparative osteological collections of the Zooarchaeology Laboratory at the Illinois State Museum, Springfield. Fragment counts and weights are presented in the primary data tables. Minimum numbers of individuals (MNIs) were calculated using the criteria of side, size, or in some cases, simply by presence; the MNI calculations for the mixed Woodland contexts include only individuals represented, in addition to those from dated contexts (Early Woodland and the Early-Middle Woodland Transition). Biomass (meat weight) estimates were calculated following Wing and Brown (1979), Reitz et al. (1987), and Reitz and Scarry (1985). Biomass estimates and MNIs are presented in the secondary data tables.

Biomass estimates predict the amount of meat represented by the bones recovered from the site, that is, the amount of tissue that would have been adhering to those bones; it is therefore a

fairly conservative estimate of the meat represented. Biomass is calculated from the bone weight and is thus susceptible to variations in bone weight due to mineralization or encrustation. However, even though the material from the Persimmon site is mineralized, since this occurs in nearly all contexts on the site, the effect of the mineralization on biomass estimates is minimal. That is, even though the bone weight is greater due to mineralization, relative differences within the assemblage are still legitimate, since nearly all of the material is mineralized to begin with.

It could not be determined whether the seven small, thin fragments of shell recovered from the site were from a small bivalve or a small gastropod. They do not likely represent food remains.

Discussion

Table 9 contains a summary of the faunal material recovered from the Persimmon site. By far, the largest assemblage is from those contexts identified as Early Woodland (Feature 1, Stratum 2, and Stratum 3).

Table 9. Summary of Persimmon Site Faunal Remains

	Early Wdld	Early-Middle Wdld Transition	Mixed Wdld	Fea. 2	Stratum 4
Adj. # Frags	508	60	142	12	17
Bone & Shell Wt.	6.4g	1.6g	4.0g	<0.1g	<0.1g
Calcined Frags. (#)	262	26	113	12	11
Burned Frags (#)	-	2	-	-	-
Worked Bone (#)	1	-	-	-	-

The high proportion of unidentifiable bone fragments (Adj. #=631) is due probably to the mineralization of the bones as well as to calcination, the result of exposure to intense or prolonged heat. At least half, and usually more, of the unidentified bone fragments in each of the contexts was calcined (see Secondary Data tables). The remaining small number of fragments which were identifiable least to class (Adj. #=108) allow only tentative conclusions to be drawn about faunal exploitation at the site.

White-tail deer is represented by only one fragment, recovered from a mixed context, although unidentifiable medium-large mammal fragments were recovered from Early Woodland and the Early-Middle Woodland Transition contexts. The only other identifiable mammal remains were from small mice, voles, or other small rodents; these were recovered in the Early Woodland and the Early-Middle Woodland transitional contexts. The rodent remains, however, could be the

result of post-occupation disturbance or of animals that died at the site during occupation, instead of being food remains.

Fish occur in all of the dateable contexts, with gar sp. being the only identifiable genus, recovered in the Early Woodland contexts. There does not seem to be a significant difference between the contexts in the contribution of fish to the diet, however, since fish remains weigh less than 0.1 g in all three.

Turtle remains (two unidentifiable carapace fragments) were recovered from the mixed contexts, and contributed more biomass than did fish to the diet, although represented by only one individual.

Seasonal information is difficult to assess from the faunal remains recovered. The one identifiable deer element (a fragment of distal epiphysis from a radius) might be indicative of fall or winter hunting, but might be from capture at any time of the year. The gar fish, although a spring spawner, could have been caught at any time as well.

All of the species identified from the Persimmon site would be expected in and around the site area. Overall, mammals seem to have been most important in the diet during both Early Woodland and Early-Middle Woodland Transition periods; this is true for the mixed contexts, also, with the addition of turtle. Use of fish seems to be relatively stable during both periods, although a case might be made for slightly greater use of fish during the Early Woodland period.

Only one fragment of worked bone was recovered, a long bone shaft fragment (either bird or small mammal) that appears to have been worked on both ends; it is possibly a broken bone head. It was found in Unit 1, Stratum 2, and is from an Early Woodland context.

11-C-152
SECONDARY FAUNAL DATA

Key:

Adj # Frags - fragment count adjusted to account for glued/fitted bones
MNI - minimum number of individuals represented
Wt - bone weight to the nearest 0.1 gram
Biomass - biomass estimate to the nearest 0.01 kilogram

Wk - worked bone
Bn - burned bone (brown or black)
Cal - calcined bone (grey, blue, green, or white)
RG - rodent-gnawed bone

(Bone Modification numbers refer to numbers of fragments exhibiting the modification.)

Table 10. Early Woodland Contexts (Feature 1, Stratum 2, & Stratum 3), site 11-C-152.

Taxon	Adj # Frags	MNI		Wt	Biomass		--Modification- Wk	Bn	Cal	RG
	#	#	%	g	kg	%	#	#	#	#
Cricetidae*	1	1	25.0	<0.1	<0.01	-			1	
Unid. rodent	1	-	-	<0.1	<0.01	-				
Unid. mammal	67	1	25.0	2.5	0.06	100.0			42	
MAMMAL SUBTOTAL	69	2	50.0	2.5	0.06	100.0			43	
Gar sp.	3	1	25.0	<0.1	<0.01	-			2	
Unid. fish	6	-	-	<0.1	<0.01	-			5	
FISH SUBTOTAL	9	1	25.0	<0.1	<0.01	-			7	
Unid. bone	426	-	-	3.9	-	-	1		212	
Unid. shell	4	1	25.0	<0.1	-	-				
TOTALS	508	4	100.0	6.4	0.06	100.0	1		262	

*Mouse and vole family

Table 11. Early-Middle Woodland Transition (Feature 3), site 11-C-152.

Taxon	Adj # Frags #	MNI #	MNI %	Wt g	Biomass kg	Biomass %	Wk #	--Modification- Bn #	Cal #	RG #
Cricetidae	1	1	33.3	<0.1	<0.01	-				
Unid. rodent	1	-	-	<0.1	<0.01	-				
Unid. mammal	4	1	33.3	0.7	0.02	100.0		1	2	
MAMMAL SUBTOTAL	6	2	66.6	0.7	0.02	100.0		1	2	
Unid. fish	3	1	33.3	<0.1	<0.01	-		1	1	
Unid. bone	51	-	-	0.9	-	-			23	
TOTALS	60	3	99.9	1.6	0.02	100.0		2	26	

Table 12. Mixed Early, Middle, & Late Woodland Contexts (Units 3, 6, 9, & 10), site 11-C-152.

Taxon	Adj # Frags #	MNI #	MNI %	Wt g	Biomass kg	Biomass %	Wk #	--Modification- Bn #	Cal #	RG #
White-tail deer	1	1	50.0	2.4	0.06	75.0			1	
Unid. mammal	4	-	-	0.4	0.01	12.5			3	
MAMMAL SUBTOTAL	5	1	50.0	2.8	0.07	87.5			4	
Unid. turtle	2	1	50.0	0.3	0.01	12.5			2	
Unid. fish	8	-	-	<0.1	<0.01	-			8	
Unid. bone	125	-	-	0.9	-	-			99	
Unid. shell	2	-	-	<0.1	-					
TOTALS	142	2	100.0	4.0	0.08	100.0			113	

Table 13. Feature 2, site 11-C-152.

Taxon	Adj # Frags	MNI		Wt	Biomass		--Modification- Wk	Bn	Cal	RG
	#	#	%	g	kg	%	#	#	#	#
Unid. bone	12	-	-	<0.1	-	-			12	
TOTALS	12	-	-	<0.1	-	-			12	

Table 14. Stratum 4 Contexts, site 11-C-152.

Taxon	Adj # Frags	MNI		Wt	Biomass		--Modification- Wk	Bn	Cal	RG
	#	#	%	g	kg	%	#	#	#	#
Unid. mammal	1	-	-	<0.1	<0.01	-			1	
Unid. bone	15	-	-	<0.1	<0.01	-			10	
Unid. shell	1	-	-	<0.1	<0.01	-				
TOTALS	17	-	-	<0.1	<0.01	-			11	

CHAPTER VIII. BOTANICAL ANALYSIS

Kathryn E. Parker

Introduction

Botanical remains recovered by flotation of soil matrix from three cultural features and five excavation units at the Persimmon site (11-C-152) were identified and evaluated. Identifiable plant materials were sparse, consisting primarily of wood charcoal, along with a few fragments of nutshell, nutmeat, and maize kernels.

Methods of Botanical Analysis

Carbonized materials in each of eight flotation samples were separated into two size fractions with the aid of a No. 10 geological sieve (2 mm mesh). Using a standard binocular microscope at low magnification (7-10x), all carbonized materials (wood charcoal, nutshell, and maize) in each large fraction (>2 mm) were extracted. Nutshell, wood charcoal, and maize fragments were subsequently weighed and counted, and all nutshell identified. An attempt was made to identify the first 20 randomly selected wood fragments (for all wood, if there were less than 20) in the large fraction. In addition to the eight samples with charred plant remains, another nine samples were found to contain only modern seeds, small teeth, insect egg cases, and unidentifiable carbon flecks.

In this analysis, wood charcoal fragments examined but found to be unidentifiable at least to family, were grouped into one of three categories: diffuse porous hardwood, ring porous hardwood, or unidentifiable. Diffuse porous wood taxa include trees such as maple (*Acer* spp.) and poplar (or cottonwood) (*Populus* spp.). Ring porous woods may be from any one of several trees commonly occurring in Illinois, including oak (*Quercus* spp.), hickory (*Carya* spp.) and ash (*Fraxinus* spp.). Wood fragments in which all distinctive morphological traits were distorted or destroyed during carbonization were classified as unidentifiable.

The small fraction (<2 mm) was examined carefully at 10-30x for seeds and other identifiable plant materials, but none were observed.

Results and Discussions

Botanical remains from a total of 90.0 liters of fill from features and excavation units were examined, yielding a total of 1.64 g of carbonized plant remains (119 fragments). Most of this material was wood charcoal, although small amounts of nutshell or nutmeat and maize were also recovered (Table 10).

Wood charcoal totaled 109 fragments (1.36 g), of which 13 were identified. Three tree taxa; hickory (*Carya* spp.), oak (*Quercus* spp.), and red oak subgroup (*Q.*, subgenus *Erythrobalanus*) were fairly well-represented, with four fragments each. A single piece of elm (Ulmaceae) was also recovered. This narrow range of wood taxa, consisting mainly of oak and hickory, is typical of the large majority of Archaic through Mississippian archaebotanical assemblages in Illinois.

Nutshell was minimal, comprised of five black walnut (*Juglans nigra*) fragments from Feature 1, and an immature acorn (*Quercus* sp.) Cotyledon from Unit 1. Both may represent remains of seasonal wild plant resources exploited by Early Woodland or late prehistoric residents of the Persimmon site.

No carbonized seeds were recovered. However, three maize or corn (*Zea mays*) fragments were identified, including one nearly complete kernel from Unit 6, and pieces of two kernel tops from Unit 1. The kernel, intact except for the embryo, measured 9.0 mm in height x 8.0 mm in width. Because these remains are from levels of excavation units and not from sealed feature contexts, and because there is little evidence supporting Early Woodland maize cultivation, it is assumed that they represent late prehistoric or historic farming activities in the site vicinity. The single piece of monocot stem recovered with kernel fragments from Unit 1 may be charred corn stalk and have a similar recent origin.

Except for the suspect maize, the plant remains (wood or nut) in feature and unit flotation samples are consistent with the types of materials recovered from other Early Woodland sites in Illinois.

CHAPTER IX. SUMMARY AND CONCLUSIONS

Steve Titus

Introduction

The Persimmon site is a multicomponent Woodland site located on the west bank of the Illinois River, about five miles upstream from its confluence with the Mississippi River. The site occupies a natural levee along the northwestern margin of a terrace overlooking the Illinois River to the north, and Swan Lake to the west. Prior to the construction of Lock and Dam 26 in 1933, the Swan Lake flood basin consisted of an extensive marsh containing several small, backwater lakes and sloughs. At normal pool level (419 ft. AMSL), Swan Lake lies approximately 9 ft. below the highest point of the terrace occupied by the site.

The Phase III excavations at the Persimmon site were part of a larger cultural resources management project involving the identification and assessment of all cultural resources present within the Swan Lake HREP project area. During the Phase I survey for this project, the Persimmon site was found to extend into the proposed construction area of Pump Station #3 (Titus et al. 1995). Phase III excavations were conducted within the small portion of the site located within the Pump Station #3 construction area. Most of the site lies outside the project area to the north.

Phase III data recovery efforts focused on the portion of the project area that had yielded positive shovel testing results during the Phase I survey. Fifty hand-dug test units, totaling 31.5 m^2 of surface area, were excavated across the site, an area of approximately 1,025 m^2 was mechanically stripped along the terrace edge and upper terrace escarpment, and all subsurface features identified at the site (n=3) were excavated. The geomorphological study conducted concurrent with the archaeological investigation used sampling tube cores and backhoe trenches to examine the deposits within the area.

The following sections summarize the results of excavations at the Persimmon site described in detail in the preceding chapters. Discussion is organized around the research questions outlined in Chapter II. These questions concerned site chronology, site structure and stratigraphy, ceramics, lithics, and subsistence.

Chronology

Ceramics diagnostic of Early Woodland Black Sand culture, Middle Woodland Havana tradition, and Late Woodland period occupations were recovered during excavations at the Persimmon site. Four components were identified at the site through cross-dating diagnostic ceramics with the ceramic types associated with the previously defined phase sequence of the lower Illinois Valley. These include a Black Sand Cypress phase component (550 B.C. - 230 B.C.), recognized on the basis of Cypress and Villegas variety ceramics, a Black Sand Schultze phase component, recognized by the presence of Schultze variety ceramics, a Havana tradition Mound House phase component (50 B.C. - A.D. 250), identified by the presence of Havana and Pike-Baehr series ceramics and a single Hopewell series sherd, and a Late Woodland Weaver/White Hall phase component (A.D. 400 - A.D. 700), recognized on the basis of Weaver/White Hall ceramics. The Schultze phase, which is assumed to be contemporaneous with the Cypress phase, represented a tentatively defined phase prior to the present investigation.

No evidence of the Early and Late Bluff components identified at the Persimmon site during the Phase I survey was recovered during the present investigation. This suggests that the portion of the site containing deposits associated with these Late Woodland occupations lies outside the current project area.

The previously determined chronological placement of the four components identified at the Persimmon site could not be confirmed during this investigation through radiocarbon dating. Two radiocarbon assays were obtained from the site, one on a bulk soil sample from Feature 1 and the other a wood charcoal sample from Feature 3. Both samples were submitted to Beta Analytic, Inc. Feature 1, which contained Cypress and Schultze phase ceramics, returned a date of 1570 +/- 60 B.P. (Beta-82039), and Feature 3, which contained Cypress and Schultze variety ceramics and Havana series ceramics, returned a date of 130 +/- 50 B.P. (Beta-82288). Both dates are clearly unacceptable.

Site Structure and Stratigraphy

The portion of the Persimmon site located in the project area is capped by a 10-30-cm-thick alluvium deposit of post-occupational origin. This surficial deposit is underlain by culturally sterile deposits on the terrace escarpment and by intact cultural deposits on the terrace. The cultural material contained in the alluvium deposit capping the terrace is inferred to have eroded from the portion of the cultural deposit exposed on the upper terrace escarpment, only to be redeposited on the terrace during subsequent flooding episodes.

Test excavations indicate the intact cultural deposits present on the terrace are confined to a relatively narrow band along the terrace margin. Artifact frequency in the units excavated along the W20 grid line, which traverses the length of the levee deposit, was more than four times higher than in those excavated along the W10 grid line, and the single test unit excavated on the W0 grid

line was culturally sterile. The terrace has been removed by erosion west of W25, so it is likely the intact cultural deposit is no more than 20 m wide inside the project area. An area of higher artifact density is located along the terrace margin between W20 S5 and W20 N15. This area of high artifact density overlaps to a considerable extent with both the area containing the three features identified during this investigation and the area in which the intact cultural deposit was identified during the Phase I survey.

The geomorphological investigation documented an A-A_2-B horizon sequence on the terrace margin. The surface A horizon is an alluvium deposit that appears to have accumulated during the last 1000 years or so, and the buried A horizon consists of Illinois River levee deposits that appear to have accumulated along the terrace margin between approximately 3,000B.P. and 2,000 B.P. . The upper portion of the buried A horizon contains the intact cultural deposit, which appears to represent an accumulation of cultural debris associated with multiple occupational surfaces buried by the vertical accretion of levee deposits.

Cultural material was found to extend from the ground surface to a depth of 60-80 cm below surface (BS) in each of the 1 m x 2 m test units, but there was a marked decline in artifact density and artifact size below a depth of 50 cm BS in most of the units. Artifact density was highest within the third, fourth, and fifth 10 cm levels in most of the units, indicating that the major occupational zone within this portion of the site lies 20-50 cm below the modern ground surface (Figure 11). Although a large sample of artifacts was recovered during test unit excavation, no evidence of features was observed in any of the units.

Four natural strata were distinguished in the soil profiles of most of the 1 m x 2 m test units (Figure 11). Stratum 1 appears to represent a post-occupational alluvium deposit containing redeposited artifacts, Stratum 2 and Stratum 3 correspond to the major occupational zone at the site, and Stratum 4 appears to represent culturally sterile sediments containing a small number of artifacts translocated downward from the overlying cultural deposit by natural processes. A buried soil horizon (Ab_{tb} or B_{tb}) identified on the terrace during the geomorphological investigation occurs at depths ranging from about 1 m BS to 1.4 m BS. Test unit excavation within this deeply buried horizon indicates it contains a minor prehistoric occupation.

The overwhelming majority (92.4%) of the classifiable sherds recovered from Stratum 2 and Stratum 3 are Early Woodland Black Sand sherds, although 13 (4.5%) Middle Woodland sherds and 9 (3.1%) Late Woodland sherds were recovered from these strata as well. Moreover, while the ceramics associated with each of the three components occur most frequently in Stratum 2, a much larger proportion of the Early Woodland ceramic assemblage occurs in Stratum 3 than is the case with the Middle or Late Woodland assemblages. This pattern, together with the virtual absence of Middle and Late Woodland ceramics below a depth of 40 cm BS, suggests that the lower portion of the major occupational zone appears to be almost exclusively associated with occupations dating to the Early Woodland period.

The vertical distribution of diagnostic ceramics at the Persimmon site indicates the deposits associated with the Early, Middle, and Late Woodland components are to some extent mixed. Evidence of mixing within the intact cultural deposit, however, was recovered from a limited number of test units, suggesting that the extent to which the temporally discrete deposits have been mixed is limited as well. Moreover, the relative frequency of Early, Middle, and Late Woodland sherds suggests the intact cultural deposit, taken as a whole, may be regarded as essentially an Early Woodland deposit.

Ceramics

Study of the ceramic assemblage recovered through Phase III excavations at the Persimmon site has produced information which sheds new light on questions concerning cultural change in the extreme southern portion of the lower Illinois Valley. The present investigation has established the existence of the Schultze phase at the Persimmon site, and has produced additional Schultze variety ceramics for future study. It appears that the Schultze phase occurred slightly later than the Cypress phase at the Persimmon site, possibly indicating that the Schultze phase was a subsequent development of the Cypress phase in the region. Villegas variety ceramics of the Cypress phase also appear slightly later in the Cypress phase at the Persimmon site, somewhat supporting earlier assumptions that these ceramics occurred late in the Cypress phase.

Other information from the Persimmon site implies that the Cypress and Schultze phases were contemporaneous with the Havana culture, at least during the latter portion of the Early Woodland period, and possibly remaining discretely coexistent well into the early Middle Woodland period in the region. Also, data from the site indicate that Havana was well developed when it appears in the archaeological record of the Persimmon site and may have intruded upon Black Sand phases occupying the area. Furthermore, no evidence of a transitional or transformational phase between these cultures was recovered from the site. It also appears that the Black Sand culture of the region remained distinct from Havana and was not assimilated into the succeeding culture since no transitional ceramic types or gradual indicators of changing ceramic technology are evident. Instead, well-developed examples of Havana and Pike/Baehr ceramics occurred in immediate context with discrete examples of Cypress and Schultze phase ceramics.

Finally, the punctuated equilibrium model (Struever 1968a), that proposes periods of relative stability punctuated by brief episodes of rapid change, does not apply at the Persimmon site since contents of Feature 3, which would have been captured in a very short time span prehistorically, still indicate discrete distinctions between Black Sand and Havana ceramics. Furthermore, the context of Feature 3 further validates the discrete distinctions between these two ceramic types, as they are similarly represented within the context of the intact cultural deposit of the site, are not the result of mixing, but instead, are contemporaneous. Therefore, it appears that the Black Sand culture of the extreme lower Illinois Valley was intruded upon by Havana, were not assimilated into the culture, and were eventually displaced from the area. This result basically

supports the twin-tradition model as proposed and defined by Farnsworth and Asch (1986:446) (Farnsworth 1986:637-638) for the lower Illinois Valley.

Lithics

The analysis of the Persimmon site lithic assemblage was designed to shed light on the lithic-procurement and tool-production strategies employed by its Black Sand occupants. These strategies were then examined in an attempt to identify the degree of mobility characterizing the Black Sand settlement strategy.

The chert utilization pattern evident in the Persimmon site lithic assemblage generally conforms to the pattern previous research has identified at Black Sand Cypress phase sites in the Illinois River Valley. The assemblage is dominated by high-quality, locally abundant Burlington chert which was probably acquired through an embedded procurement strategy given the wide availability of this material within the presumed catchment of the site occupants. Small amounts of a variety of other chert types were identified in the collection, including several nonlocal chert types that indicate the occupants of the Persimmon site interacted with groups outside the region.

Evidence of both biface and amorphous core technologies was identified in the lithic assemblage. The tool-production strategy evident in the site collection reflects a strong emphasis on biface technology, with on-site lithic reduction activities focusing on the maintenance and repair of small bifaces made of Burlington chert. Amorphous core technology appears to represent a minor component of the tool-production strategy employed by the site occupants.

The much greater emphasis given biface technology than amorphous core technology at the Persimmon site generally conforms to the tool-production pattern characteristic of highly mobile groups. The flexibility and portability of biface technology makes this tool-production strategy especially attractive in situations where future tool-needs cannot be precisely anticipated and where sources of raw material for replacing tools occur at great distances from tool-use locations (Goodyear 1979; Parry and Kelly 1987; Morrow 1988). Situations such as these characterize subsistence strategies involving both residential mobility and logistical mobility by smaller task groups (Binford 1980).

The Persimmon site lithic assemblage consists almost entirely of stone tool manufacturing debris, indicating a narrow range of activities occurred at the site. This suggests the site represents a series of occupational episodes of relatively short duration. This interpretation is supported by other evidence, including the small number of pit features present at the site, and the absence of storage facilities and structures. Ceramics are fairly abundant at the Persimmon site, however, suggesting it may have been occupied by small residential groups rather than special activity groups.

Subsistence

Botanical Remains

A small quantity of carbonized plant remains (1.64 g/119 fragments) was recovered from the flotation samples taken from features and test units. Most of this material was wood charcoal, although small amounts of nutshell or nutmeat and maize were also recovered. No carbonized seeds or tuber fragments were recovered, and the maize fragments are assumed to represent late prehistoric or historic farming activities in the site vicinity.

Charcoal density was low at the site, averaging approximately 0.18 g/10 liters of sediment. By weight, 17% of the charcoal consisted of nutshell (black walnut and acorn) and 83% consisted of wood (hickory, oak, red oak, and elm). Five of the six nutshell fragments, all black walnut, were recovered from Feature 1, a pit feature containing Black Sand Cypress phase and Schultze phase ceramics.

Except for the suspect maize, the Persimmon site plant remains (wood and nut) in feature and unit flotation samples are consistent with the types of materials recovered from other Early Woodland sites in Illinois. The presence of walnuts and an acorn, which were available for collection in September and October, indicates the site was occupied during the fall during some portion of its long occupational history.

Faunal Remains

The Persimmon site faunal assemblage consists of 743 fragments of bone and shell recovered during the screening of test unit fill in the field and during the analysis of laboratory processed flotation samples taken from features and units. Only about 15% of the bone and shell fragments were identifiable at the level of class or lower, the high proportion of unidentifiable bone apparently being attributable to the prevalence of mineralization and calcination.

Overall, mammals seem to have been the most important element of the site occupants' diet. Mammal remains represented in the Persimmon site faunal assemblage consist of white-tail deer (n=1) and unidentifiable medium-large mammal (n=83). Of the 83 unidentifiable mammal bone fragments in the assemblage, 45 (54%) were recovered from Feature 1 (Black Sand), 4 (5%) were recovered from Feature 3 (Black Sand/Havana), and the remainder were distributed throughout the cultural deposit. Fish remains, including gar sp. (n=3), are also represented in the assemblage, although they occur considerably less frequently than mammal remains. Of the 20 fish bone fragments identified in the assemblage, 2 (10%) were recovered from Feature 1, 3 (15%) were found in Feature 3, and the remainder were distributed throughout the cultural deposit. Two calcined turtle carapace fragments were recovered from the cultural deposit during test unit excavation.

The Persimmon site faunal assemblage provides little information concerning faunal exploitation strategies or seasonality of occupation. The assemblage does suggest that both woodland and aquatic environments played a role in the subsistence of the site occupants, and the presence of turtle shell, a likely indicator of summer food harvesting activities, suggests the period of site occupation included this season.

Conclusion

The Persimmon site represents a series of Woodland occupations dating to the Early Woodland, Middle Woodland, and Late Woodland periods. The site was most intensively occupied by Early Woodland Black Sand Cypress and Schultze phase groups. Despite moderately high artifact density and the presence of a relatively deep cultural deposit, feature density and artifact assemblage diversity are low, and storage facilities and structures are absent. This pattern suggests the site consists of numerous reoccupations, each of generally short duration. The presence, however, of a fairly large ceramic assemblage suggests the site may have been repeatedly occupied by small, highly mobile residential groups. This settlement pattern is characteristic of a foraging subsistence strategy.

The faunal and botanical assemblages contain little evidence of seasonality, although the presence of turtle and nuts may indicate summer and fall occupations. In any event, the Persimmon site was clearly a favored settlement location for Black Sand groups for perhaps hundreds of years, giving ready access to a range of resources associated with both woodland and aquatic environments.

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APPENDIX A

SCOPE OF WORK

Contract
Historic Properties Data Recovery, Data
Analysis and Report Preparation for
Persimmon Site (11-C-152)
Swan Lake Habitat Rehabilitation Enhancement Project (HREP),
Environmental Management Program (EMP),
Pool 26, Illinois River
Calhoun County, Illinois

1. Statement of Work. Work consists of Phase III data recovery through subsurface testing (hand excavation of .5 m x .5 m units followed by 1 x 2 m units and mechanical stripping of the overburden to locate features) artifact analysis and report preparation. Work will be conducted in the portion of the site which will be impacted by proposed construction of Pump Station #3, Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP) located in Pool 26, Illinois River (mile 5.0 along the right [west] bank), Calhoun County, Illinois. All investigations will be confined to the portion of the site owned by the Corps. All work accomplished by the Contractor will be reviewed and approved by the Corps of Engineers, St. Louis District (COE). Official point of contact for technical questions will be the Project Archaeologist, Ms. Suzanne E. Harris of the District Office at (314) 331-8467.

2. Project Description. The St. Louis District is proposing to construct Pump Station #3 and two associated channels running to the Illinois River and Swan Lake. The pump station construction will disturb an area approximately 600 feet x 90 feet x 12 feet deep (maximum). Relevant plans shall be provided to the Contractor by the Government. Pump Station #3 is intended to improve wetland and aquatic habitats for waterfowl and fish by improving water level control and decreasing sedimentation in the lower of three lake units. This project is a part of the Environmental Management Program which as established by PL-99-662 to enhance and rehabilitate the Upper Mississippi River system. The proposed Pump Station #3 is located on Corps of Engineers fee land managed by the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge, U.S. Fish and Wildlife Service (FWS).

3. Background. The Persimmon site was recorded in the mid-1970's during an Illinois River shoreline survey conducted by the Contract Archaeology Program, Kampsville, Illinois for the St. Louis District. The site was revisited during the Phase I survey for the Swan Lake HREP conducted by American Resources Group for the St. Louis District (see the draft report, "A Phase I Archaeological Survey for Historic Properties Within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois", by Steve Titus, et al., 1994). The site dimension along the shoreline was expanded and the portion of the site to be impacted

by construction of the proposed Pump Station #3 was systematically shovel tested. During a meeting on November 14, 1994 in Springfield, Illinois, representatives of the COE, the Contractor and the Illinois State Historic Preservation Officer, agreed upon the eligibility of the Persimmon site and the need to mitigate the portion of the site within the proposed construction area.

4. Site Description. For a full description of previous investigations, stratigraphy, diagnostic artifacts and occupations present at the Persimmon site, see the draft Phase I report (Paragraph 3). To summarize, the previously recorded Persimmon site (11-C-152) is a large moderately dense to dense scatter of prehistoric artifacts situated on a terrace overlooking the Illinois River and Swan Lake. Investigations will focus on the small portion of the site's southern end which will be impacted by proposed construction of Pump Station #3 and its associated channels. Most of the site lies outside the project area to the north. The portion of the site to be investigated lies within second growth woods with a fairly dense understory of brush, saplings and weeds. The phase I survey located a continuous prehistoric artifact scatter on the narrow, sandy beach along the full length of the Persimmon site, but the artifact density was highest along the portion of the shoreline located with in the pump station construction area. Moving uphill from the shoraline, The artifact density is highest on the wooded terrace and high on the upper slope of the escarpment. The highest artifact density is associated with an intact midden remnant about 27 cm thick, which is overlain by 25 cm of recent alluvium. Diagnostic artifacts recovered from the portion of the site within the project area indicate three prehistoric occupation phases, one Early Woodland phase (similar to the Florence Street Phase) and two Late Woodland phases (similar to Early Bluff and Late Bluff). No evidence of late 17th or early 18th century occupations related to the Tamaroa Massacre (1680) or later Indian/French Colonial occupations, which was reported by a local informant, has been found during professional investigations.

5. Research Questions. The contractor shall prepare a research design to address the following points. Previous investigations suggest that the most important research questions which this site can potentially answer concern more precisely defining the number and nature of occupations present. Thus far, three occupations have been defined from the proposed Pump Station #3 area: one Early Woodland and two Late Woodland (Early Bluff and Late Bluff). (A Middle Woodland occupation was defined during the 1970's but has not been found in the portion of the site under investigation.) In addition to attempting to define the density and spatial distribution of each occupation, investigations should focus on refinement of the ceramic typology and chert sources, particularly if features are present. If plant material and bone are present, information of subsistence during the occupations and shifts in species used may be obtained. Elsewhere it has been suggested that

during the Early Woodland horticulture varies in importance from locality to locality and investigations here can provide important comparative information. For each of the three occupations the settlement type may be defined and compared. Such studies should be useful in determining the sites relationship during these three period to the Illinois River valley to the north and the northern American Bottoms to the south.

6. Data Recovery.

6.1 The site shall cleared of weeds and brush by brush hogging or some other suitable method, if necessary. The portion of the site within the proposed construction area shall be grided using a 10 m grid. A series of .5 m x .5 m units shall be excavated to confirm or reassess the lack of intact deposits indicated by the Phase I shovel testing. This testing shall be conducted in the area of positive shovel testing during Phase I. No more than 50 such units shall be excavated, unless agreed to by the Project Archaeologist. Each unit shall be excavated by natural levels, if apparent, or 10 cm levels otherwise. (Controlled surface collection will not be attempted since it would require plowing of this previously unplowed, heavily wooded area.)

6.2 Based on results of the .5 m x .5 m unit excavations, a series of 1 x 2 m units not to exceed 15 units shall be excavated by hand to subsoil. A series of units not to exceed 10 shall be excavated in a systematic manner in the midden remnant identified during Phase I. The remaining units may be placed in intact deposits as indicated by the .5 m x.5 m unit test. If the intact deposits outside the midden are more extensive than expected, the Project Archaeologist and the Contractor will confer to determine the need for additional units. Units shall be expanded to expose all of a feature. All artifact concentrations and features encountered shall be plotted, mapped and photographed in situ. Plan view and profile maps of soil strata, features and artifact distributions shall be completed at the base of each level. The standard vertical excavation unit will be natural or cultural levels if present, or if absent, in arbitrary 10 cm levels. All soil from each vertical excavation level be screened through 1/4" hardware cloth.

6.3 In the midden remnant, flotation samples of the midden shall be obtained as follows. After unit excavations in the midden are completed, 5 units shall be selected from which midden flotation samples shall be obtained. A .25 x .25 m column shall be excavated into the midden in one wall of each of the five units selected. The columns shall be excavated in natural or cultural strata if present, or if absent, in arbitrary units of 10 cm. All soil from each level will be containerized, labeled and analyzed as a unit. The samples from each will be floated and the floral, faunal and nonbiotic cultural remains shall be analyzed by the appropriate specialists.

6.4 All features shall be excavated. Features shall be excavated by removing 1/2 as a block, and excavating the remaining 1/2 in natural levels, if apparent. A sample of fill shall be taken from each feature (or natural level, if present) for flotation. The sample shall be 10 liters or the entire feature, whichever volume is smaller. Soil samples may also be taken.

6.5 Based on the results of the .5 m x .5 m unit and 1 x 2 m unit excavations, the portion of the site in the construction area shall be examined for subsurface features by mechanically removing deposits over the subsoil to the extent possible given the wooded nature of the site. In the stripped areas, the Contractor shall expose all visible features by shovel scraping where necessary. Features will then be recorded, excavated and fill samples taken as specified above.

6.6 Geomorphological investigations with a hand corer and/or backhoe trenching shall be conducted to document the depositional history of the site. Investigations shall focus on post prehistoric occupation impacts to the site, principally shore erosion. Results of investigations shall be used in interpreting areas of intact cultural deposits and areas lacking such deposits. Investigations may include trenching in apparent eroded areas along the lower slope and one or more transects of cores across the cultural deposits.

6.7 Photographs: Photographs shall be black and white prints and color slides. A photographic log of annotated 35 mm slides, showing each phase of investigation in progress, shall be included as an appendix with the final report original. Photographs included in the final report shall be selected as discussed below (Paragraph 9.1). These photographs shall show details of field conditions, features, profiles, artifacts, or other evidence of past cultural activity. For the purpose of reproduction, these shall be black and white half tone prints. Suitable reproductions of the original prints shall be included in each copy of the final report.

6.8 Monumentation and Contour Mapping. The Contractor is responsible for establishing a site datum. A primary survey monument will be provided by the Government and placed by the Contractor. A 1 foot interval contour map shall be produced.

6.9 Laboratory Procedures. Artifacts collected during excavation shall be cleaned, permanently labeled, and catalogued according to the St. Louis District Curation Standards. Associated Records, including all documents and photographs relating to the entire project shall also be curated according to the St. Louis District Curation Standards. The contractor shall analyze the collection by separating the artifacts into appropriate material categories, then subdividing as needed into smaller, functional and stylistic categories. Samples of feature fill shall be floated and analyzed.

Basic analytical studies include, but are not limited to:

a. Lithic analysis. This shall include a description of morphological, functional, and stylistic attributes, as well as the identification of raw material. Analysis shall also determine intrasite and local relationships.

b. Ceramic analysis. This shall include a description of morphological and stylistic attributes, and shall also identify intrasite and local relationships. Analysis of the ceramics shall include defining temporal positions as precisely as possible.

c. Floral analysis. A palaeoethnobotanist shall use a volumetrically and statistically controlled sample to identify and interpret floral remains excavated or recovered through flotation.

d. Faunal analysis. A zooarchaeologist shall use a volumetrically and statistically controlled sample to identify and interpret faunal remains collected or recovered through excavation or flotation.

e. Radiocarbon dating. The Contractor shall collect and containerize all excavated materials that would be suitable for radiocarbon dating. Based on the provenience and information potential of any samples thus obtained, the project Archaeologist will determine which samples (if any) are to be dated.

7. Conferences: Conferences shall be held at least 3 times during the period of this contract. The initial conference shall be a Post-Award Meeting at which the Contractor's Principal Investigator and Field Supervisor, the Corps Project Archaeologist and a representative from the U. S. Fish and Wildlife Service shall coordinate plans for the performance of the contract. The second conference shall be attended by the same personnal and shall be held during the conduct of the field work. The third conference shall take place after the conclusion of laboratory analysis (Paragraph 6.9). This meeting shall be attended by the Contractor and Corps, plus a representative of the Illinois State Museum (if they wish). This conference shall be for the purpose of inspecting the collections for storage and retrieval.

8. Location and Description of the Study Area: A map showing the site location is located in the above referenced Phase I report. Larger scale maps of the proposed pump station construction area shall be furnished to the Contractor by the Government. A Government representative familiar with the proposed Pump Station #3 construction area will accompany the Contractor during the initial site inspection.

9. Reporting:

9.1 Draft Report. The Contractor shall submit a draft report

which shall be a complete and accurate representation of the final report. The report shall be a technical report of the results of the excavations and also shall address the research questions posed above. This latter shall include discussion of how the results of the work will contribute to the present understanding of the lower Illinois Valley culture history. The draft (and final) report shall include photographs and/or graphics which shall accurately show: 1)the location and topographic position of the Persimmon Site; the location of artifact clusters, excavation units and mechanically stripped areas; and 3) the details of features, profiles, artifacts, or any other cultural evidence. The draft report shall be typed and double spaced, and six (6) copies shall be provided to the Project Archaeologist. All pages shall be numbered. The draft shall be completely proofread so that it shall be free of typographic errors and other editorial deficiencies. Drawings, tables and other non-photographic illustrations shall appear in the same quality, size, format, and location in the draft report as they will be in the final report. Photographs shall not be enlarged and reproduced for the draft report. The Contractor shall submit contact prints with recommendations for those to be included in the final report to the COE. The COE will make the final selections. The COE will review these and select those to be included in the final report. The Contractor shall then be responsible for enlargement and reproduction as instructed by the COE, according to the specifications above (paragraph 1.3).

9.2 Final Report. The final report shall incorporate review comments made on the draft report and fifty (50) copies shall be submitted to the Contractor by the COE. The Final Report shall be compiled and reproduced in accordance with the enclosed Cultural Resource Investigations, Part I, Section C, 7.2. Maps and drawings may be prepared using either mechanical or computer generated lettering and shall be in accordance with good drafting practice.

10. Government Furnished Information: The Government shall furnish to the Contractor the following items: (1) St. Louis District Report Format Requirements, (2) St. Louis District, Swan Lake Complex, Habitat Rehabilitation and Enhancement Project Plans and Specifications, including maps showing the proposed pump station location, (3) St. Louis District Curation Standards, (4) Survey Monuments. These four (4) items shall be forwarded under separate cover.

11. Contractor Capability: It is anticipated that the following personnel types may be required at some point during the completion of the delivery order: (1) Principal Investigator (1), (b) Field Supervisor (1), (c) Lab Supervisor (1), (d) Lab Assistant (1), (e) Field Archaeologist (3), (f) Paleoethnobotanist (1), (g) Zooarchaeologist (1), (h) Geomorphologist, (i) Clerical (1), (j) Data Processing Technician (1), and (k) Draftsman (1). A backhoe also will be required.

12. Publicity. The Contractor shall not release any information to the public without written approval of the St. Louis District Commander. The Contractor may release information to Consolidation Coal Company. It is not the government's intent to restrict in any way the Contractor's desire to publish in scholarly or academic journals.

13. Right-of-Entry. The land in the contract area is Federally owned. Contractor is responsible for obtaining any right of entry necessary to cross private property to reach the contract area. At least one week prior to beginning field work, the Contractor shall notify Ms. Suzanne Harris, Project Archaeologist for the Swan Lake construction project, St. Louis District office at (314) 331-8467. At the same time, the Contractor shall also notify Ms. K. L. Drews, Refuge Manager, FWS, Brussels District, Mark Twain National Wildlife Refuge at (618) 883-2524.

14. Schedule of Work:

14.1 Post-Award Meeting. This meeting shall be held within 5 calendar days after receipt by the Contractor or written notice of the contract award. The purpose of the meeting shall be to meet the Contractor's staff and to discuss the specifics of the contract. The meeting shall take place in the Wildlife Division office.

14.2 Meeting 2: This meeting shall occur at the approximate 50% completion point of field work and shall take place at the Persimmon Site.

14.3 Meeting 3. This meeting shall occur at the completion of the artifact analysis/processing and prior to transmittal of The artifacts and documents to the Illinois State Museum. This meeting shall take place in the Contractor's office.

14.4 Field Work. All field work shall be completed within 30 calendar days of the award of the contract.

14.5 Interim Report. A brief Interim Report shall be submitted within 7 calendar days after completion of the investigation. the report shall briefly describe the results of the investigations and provide any appropriate tentative recommendations.

14.6 Analysis and Draft Report. Artifact analysis and draft report preparation shall be completed with 70 calendar days following award of the contract.

14.7 Review. Government review comments will be furnished to the Contractor within 30 calendar days after receipt of the draft report. The Government shall conduct coordination with the Illinois State Historic Preservation Officer and the U. S. Fish and Wildlife Service.

APPENDIX B

SOIL DESCRIPTIONS

SOIL PROFILE DESCRIPTIONS-SAMPLING TUBE CORES

NOTE:
See the Cross Section Figures 8 and 9 for soils descriptions along Trench 2.

SITE NAME: ST1 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Early late Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying, along floodplain ridge.
PARENT MATERIALS: Mississippi River alluvium.
WATER TABLE: 165cm.
SLOPE: 0%
VEGETATION: Winter wheat field
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm.
DATE DESCRIBED: 4/19/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Apparent late Holocene Miss. R. levee deposits over older late Holocene Mississippi River alluvium.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	Ap	10YR 2/3; loam (fine sandy silt); weak medium subangular blocky; friable; common fine roots and root holes; leached; abrupt smooth.
20-45	AB	10YR 2/3; loam (fine sandy silt); moderate medium subangular blocky; friable; common to many fine roots and root holes; common medium distinct mottles; few medium Fe concretions; few clay skins at base of horizon; pH 5.5; clear wavy.
45-65	Bw	7.5YR 4/6; sandy loam (silty fine sand); weak medium subangular blocky; friable; common fine roots and root holes; many medium distinct mottles, few medium Fe concretions; few clay skins down root and worm holes; pH 5.5; clear wavy.
65-95	Bw2	10YR 4/4; loam (fine sandy silt); moderate medium subangular blocky; friable; very few argillans down root and worm holes; slightly finer grained than above; common medium distinct mottles; pH 5.5; clear wavy.

95-120	Btb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; common argillans; finer grained than above; few fine faint mottles, few fine Fe concretions; pH 5.5; clear wavy.
120-165	BCb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; few fine root holes; common medium distinct mottles, common medium Fe concretions; leached; abrupt smooth.
165-240	Cb	10YR 6/3; medium fine sand; single grained; loose; few coarse faint mottles, few 0.5cm brown silt seams; leached

SITE NAME: ST2 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying, midslope into floodplain swale.
PARENT MATERIALS: Mississippi River alluvium.
WATER TABLE: 110cm.
SLOPE: 0-2%
VEGETATION: Winter wheat field
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 185cm.
DATE DESCRIBED: 4/19/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Apparent late Holocene Miss. R. levee deposits over older late Holocene Mississippi River alluvium.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-15	Ap	10YR 2/2; silt loam; weak medium subangular blocky; friable; common fine roots and root holes; leached; abrupt smooth.
15-30	A	10YR 2/2; silt loam; moderate medium subangular blocky; friable; many fine roots and root holes; few fine faint mottles; at base of horizon; pH 5.5; clear wavy.
30-85	Bt	10YR 4/3; silt loam to silty clay loam; moderate medium subangular blocky; friable; many fine roots and root holes; common medium distinct mottles, common medium Fe concretions; common argillans; pH 5.5; clear wavy.
85-110	ABtb	10YR 2/3; silty clay loam; moderate medium subangular blocky; friable; many fine roots and worm holes; common argillans down root and worm holes; 0.5 gram charcoal chunk; common medium distinct mottles, common medium Fe concretions; pH 5.5; clear wavy.
110-120	Bw	10YR 4/3; loam; moderate medium subangular blocky; friable; common medium distinct mottles, common medium Fe concretions; coarsening with depth; pH 5.5; clear wavy.

120-185	C	10YR 4/3; sandy loam (silty medium sand); weak medium subangular blocky, becoming single grained by 140cm; loose; common medium and coarse prominent mottles; coarsening with depth; leached.

SITE NAME: ST3 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying in swale.
PARENT MATERIALS: Mississippi River alluvium.
WATER TABLE: 110cm.
SLOPE: 0-2%
VEGETATION: Winter wheat field
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 210cm.
DATE DESCRIBED: 4/19/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Apparent late Holocene Miss. R. levee deposits over older late Holocene Mississippi River alluvium.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	Ap	10YR 2/1; silt loam; weak medium subangular blocky breaking to moderate medium granular; friable; common to many fine roots and root holes; pH 6.5; abrupt smooth.
20-65	Bw	10YR 3/2; silt loam; moderate medium subangular blocky; friable; common fine roots and root holes; few argillans; pH 5.5; clear wavy.
65-115	ABtgb	10YR 3/1; silty clay loam; moderate medium subangular blocky; friable; many fine roots and worm holes; few to common argillans; fine grained organic enriched swale fill; common medium distinct mottles, many medium Fe concretions; leached; gradual smooth.
115-190	BCgb	10YR 4/2; silty clay loam; weak medium subangular blocky to massive; sticky; common medium distinct mottles, few medium Fe concretions; leached; abrupt smooth.
190-210	Cb	medium sand; no recovery.

SITE NAME: ST4 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying in swale.
PARENT MATERIALS: Mississippi River alluvium.
WATER TABLE: 115cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 375cm.
DATE DESCRIBED: 4/19-20/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Early late Holocene Mississippi River alluvium.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	A	10YR 2/1; silt loam; moderate medium granular; friable; common to many fine roots and root holes; cultural "flake" recovered from core at 5cm; pH 5.5; clear wavy.
20-40	A2	10YR 2/1; silt loam; weak medium subangular blocky; friable; common to many fine roots and root holes; a dense more compacted horizon compared to above; pH 6.0; clear wavy.
40-80	Bw-Bt	10YR 4/3; silt loam; moderate medium subangular blocky; friable; few argillans; common medium distinct mottles; pH 5.5; clear wavy.
80-120	BC	10YR 4/4; loam; moderate medium subangular blocky; friable; common medium distinct mottles, common medium Fe concretions; leached; gradual smooth.
120-375	C	10YR 4/4; loam (fine sandy silt); massive; sticky; common medium distinct mottles, few medium Fe concretions; flood laminae of fine sand begin at 140cm, laminae vary in thickness and are silt, fine sand and silty fine sand, some organic enriched gleyed silt units at about 300cm, fine sand from about 330cm to 375cm; leached.

SITE NAME: ST5 (and Trench #1) Persimmon Site Illinois River
GEOMORPHIC SURFACE: Late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 140cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 375cm.
DATE DESCRIBED: 4/20/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Late Holocene Illinois River levee deposits capping the older early late Holocene Mississippi River terrace. A weak paleosol is seen below the contact in Miss. R. alluvium, and is mostly a remnant Bw, ABt or Bt horizon at around 1.0 meter. The adjacent Trench 2 has a radiocarbon date of 3770+/-90BP (Beta 82040), and the lower flood alluvium around 3.50 to 3.75 meters in Trench 1 is dated 4030+/-50BP (Beta 82042).

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	A	10YR 2/1; loam (clayey silt sand); moderate coarse granular; friable; many fine roots and root holes; very poorly sorted with some coarse sand and granules; pH 6.0; clear wavy.
20-50	A2	10YR 2/1; loam (clayey silt sand); moderate medium subangular blocky breaking to moderate medium granular; friable; common to many fine roots and root holes; a dense more compacted and cohesive horizon compared to above; pH 7.0; clear wavy.
50-70	2AB	10YR 2/3; silt loam; moderate medium subangular blocky; friable; organic material root and worm holes; few fine faint mottles; pH 5.5; clear wavy.
70-90	2Bw	10YR 4/3; loam; moderate medium subangular blocky; friable; common fine roots and worm holes; many medium distinct mottles, common medium Fe concretions; leached; clear wavy.

90-105	2Ab	10YR 3/2; silt loam; moderate medium subangular blocky; friable; common fine root holes; pH 5.5; clear wavy.
105-130	2BCb	10YR 4/3; loam (fine sandy silt); weak medium subangular blocky to massive; friable; few fine root holes; common medium to coarse distinct mottles, common medium Fe concretions; leached; gradual smooth.
130-140	2BC2b	10YR 4/2; silt loam; moderate medium subangular blocky; friable; common medium distinct mottles, few medium Fe concretions; leached; gradual smooth.
140-350	2Cb	10YR 4/2; silt loam (flood laminae); massive to loose; sticky; common medium distinct mottles, common medium Fe concretions; flood laminae of fine sand begin at 140cm, laminae vary in thickness and are silt, fine sand and silty fine sand; pH 6.0; abrupt smooth.
350-375	2ACgb2	N2/0; silt loam to loam; massive to loose; sticky; laminae of silt and very fine sandy silt; gleyed and organic enrichment, tree bark, acorn caps, leaf litter; radiocarbon sample dated 4030+/-50BP (Beta 82042); leached.

SITE NAME: ST6 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 140cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 300cm.
DATE DESCRIBED: 4/20-21/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Late Holocene Illinois River levee deposits capping the older late Holocene Mississippi River terrace.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	A	10YR 2/1; loam; moderate coarse granular; friable; many fine roots and root holes; very poorly sorted with some coarse sand and granules; pH 6.0; clear wavy.
20-45	A2	10YR 2/1; loam to silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common to many fine roots and root holes; poorly sorted; a dense more compacted and cohesive horizon compared to above; pH 6.5; clear wavy.
45-70	2Bw	10YR 3/3; silt loam; moderate medium subangular blocky; friable; organic material root and worm holes; many medium distinct mottles; common medium Fe concretions; pH 5.5; clear wavy.
70-100	2BC	10YR 4/4; loam (fine sandy silt); weak medium subangular blocky to massive; friable; common fine roots and worm holes; many medium distinct mottles, common medium Fe concretions; leached; gradual smooth.
100-240	2Cb	10YR 4/3; silt loam (fine sandy silt); massive; sticky; leached; gradual smooth.
240-300	2C2b	N3/0 - 10YR 4/1 - 4/3; silt and very fine sand; massive to loose; sticky; laminae of silt and very fine sandy silt; gleyed and some organic enrichment; leached.

SITE NAME: ST7 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 30cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 120cm.
DATE DESCRIBED: 4/22/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Eroded Late Holocene Illinois River levee deposits capping the older late Holocene Mississippi River terrace.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-10	C	10YR 2/2 - 3/3; sandy loam; massive to single grained; PSA laminae of sand and silty sand; friable; many fine roots and root holes; very poorly sorted with some coarse sand and granules; pH 8.0; clear wavy.
10-30	A	10YR 2/1 - 2/2; loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine roots, oxidized roots and root holes; very poorly sorted with some coarse sand and granules; pH 6.0; clear wavy.
30-60	2Bw	10YR 3/3; silt loam; moderate medium subangular blocky; friable; organic material root and worm holes; many medium distinct mottles; many medium Fe concretions; well sorted; pH 6.5; clear wavy.
60-110	2Bw2	10YR 4/2; silt loam; moderate medium subangular blocky; sticky; common fine roots and worm holes; many medium distinct mottles, common medium Fe concretions; leached; abrupt smooth.
110-120	2C	10YR 4/4; silt and very fine sand; massive to loose; sticky; laminae of silt and very fine sandy silt; leached.

SITE NAME: ST8 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Eroded late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 25cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 150cm.
DATE DESCRIBED: 4/22/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Eroded Late Holocene Illinois River levee deposits capping the older late Holocene Mississippi River terrace.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-10	Oi	10YR 2/2; organic material; massive; fibric; very friable; many fine roots and root holes; pH 6.0; abrupt smooth.
10-30	A	10YR 2/1; silt loam with few coarse sand; moderate coarse granular; friable; many fine roots and root holes; very poorly sorted with some coarse sand and granules; pH 7.0; abrupt smooth.
30-35	A2	10YR 2/3; loamy sand; single grained; friable; erosional lag with cultural flakes, pebbles and granules; poorly sorted; leached; abrupt smooth.
35-50	Bw	10YR 3/3; loam; moderate medium subangular blocky; friable; poorly sorted; organic material down root and worm holes; common medium distinct mottles; leached; clear wavy.
50-70	2Bwb	10YR 4/3; silt loam; weak medium subangular blocky to massive; friable; many fine roots and worm holes; common medium distinct mottles; well sorted; leached; gradual smooth.
70-100	2Cb	10YR 4/3; silt loam (fine sandy silt); massive; sticky; many medium distinct mottles, common medium Fe concretions; few fine root holes; leached; gradual smooth.

100-150	2C2b	10YR 4/2 - 4/3; silt and very fine sand; massive to loose; sticky; laminae of silt and very fine sandy silt; leached.

SITE NAME: ST9 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Early late Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Mississippi River alluvium.
WATER TABLE: 170cm.
SLOPE: 0%
VEGETATION: Winter wheat field
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 200cm.
DATE DESCRIBED: 4/24/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Early late Holocene Mississippi River alluvium, east of ST1 core and not shown on cross section.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	Ap	10YR 2/1; silt loam; weak medium subangular blocky; friable; many fine roots and root holes; leached; abrupt smooth.
20-35	AB	10YR 2/3; silt loam; moderate medium subangular blocky; friable; common to many fine roots and root holes; leached; clear wavy.
35-90	Bt	10YR 3/3; silty clay loam; moderate medium subangular blocky; sticky; many fine roots and root holes; common medium distinct mottles, common medium Fe concretions; few clay skins down root and worm holes; leached; clear wavy.
90-115	BC	10YR 4/4; silt loam; weak to moderate medium subangular blocky; sticky; few fine root holes; common medium distinct mottles, common medium Fe concretions; coarsening with depth; clear wavy.
115-200	C	10YR 4/3; loam; massive; sticky; many medium distinct mottles, common medium Fe concretions; coarsening with depth becoming silty medium fine sand by 175cm; leached.

SITE NAME: ST10 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 140cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm.
DATE DESCRIBED: 4/24/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Late Holocene Illinois River levee deposits capping the older early late Holocene Mississippi River terrace. Illinois River levee deposits extend to 35cm. Could not see lower paleosol in core.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	A	10YR 2/1; sandy loam; weak medium granular; friable; many fine roots and root holes; very poorly sorted with some coarse sand and granules; leached; clear wavy.
20-35	A2	10YR 2/1; loam (clayey silt sand); moderate medium subangular blocky breaking to moderate medium granular; friable; many fine roots and root holes; leached; clear wavy.
35-55	2AB	10YR 3/3; silt loam; moderate medium subangular blocky; friable; organic material root and worm holes; leached; clear wavy.
55-75	2Bt	10YR 4/3; silt loam; moderate medium subangular blocky; friable; common fine roots and worm holes; few fine faint mottles, common argillans; leached; clear wavy.
75-105	2BC	10YR 4/3; silt loam (very fine sandy silt); massive; friable; common medium distinct mottles, common medium Fe concretions; leached; clear wavy.
105-150	2C	10YR 4/3; silt loam (very fine sandy silt); massive; friable; common medium distinct mottles, common medium Fe concretions; leached; gradual smooth.

150-180	2C2	10YR 4/2; silt loam (flood laminae); massive to loose; sticky; common medium distinct mottles, common medium Fe concretions; laminae vary in thickness and are silt, fine sand and silty fine sand; leached.

SITE NAME: ST11 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 150cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm.
DATE DESCRIBED: 4/24/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Late Holocene Illinois River levee deposits capping the older early late Holocene Mississippi River terrace. Illinois River levee deposits extend to 75cm. A thin cap of PSA.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-10	C	10YR 6/3; medium sand; single grained; loose; PSA unit; leached; abrupt smooth.
10-30	A	10YR 2/1; sandy loam; weak medium granular; friable; common fine roots and root holes; very poorly sorted with some coarse sand and granules; leached; abrupt smooth.
30-75	AB	10YR 2/1; sandy loam (coarse sand with minor silt); weak medium granular; friable; many fine roots and root holes; leached; abrupt smooth.
75-120	2Bw	10YR 4/3; silt loam; moderate medium subangular blocky; friable; common medium distinct mottles; leached; gradual smooth.
120-180	2C	10YR 4/2; silt loam (flood laminae); massive to loose; sticky; common medium distinct mottles, common medium Fe concretions; laminae vary in thickness and are silt, fine sand and silty fine sand; leached.

SITE NAME: ST12 Persimmon Site Illinois River
GEOMORPHIC SURFACE: Eroded late Holocene Illinois River levee over early late Holocene Mississippi River surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River and Mississippi River alluvium.
WATER TABLE: 150cm.
SLOPE: 0-2%
VEGETATION: Mixed hardwood.
METHODOLOGY: Sampling tube core.
DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm.
DATE DESCRIBED: 4/24/1995
DESCRIBED BY: Jeff Anderson
REMARKS: Eroded late Holocene Illinois River levee deposits capping the older early late Holocene Mississippi River terrace. Illinois River levee deposits extend to 35cm.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-5	A	10YR 2/1; sandy loam; weak medium granular; friable; common fine roots and root holes; very poorly sorted with some coarse sand and granules; eroded A horizon; leached; abrupt smooth.
5-30	A2	10YR 2/1; loam (clayey silt sand); moderate medium subangular blocky breaking to moderate medium granular; friable; many fine roots and root holes; leached; clear wavy.
30-35	AB	10YR 3/3; loam (silty coarse sand); moderate medium subangular blocky; friable; many fine roots and root holes; leached; abrupt smooth.
35-70	2Bw	10YR 4/3; silt loam; moderate medium subangular blocky; friable; common medium distinct mottles; leached; gradual smooth.
70-120	2C	10YR 4/3; silt loam (very fine sandy silt); massive; friable; common medium distinct mottles, common medium Fe concretions; leached; gradual smooth.
120-180	2C2	10YR 4/2; silt loam (flood laminae); massive to loose; sticky; common medium distinct mottles, common

APPENDIX C

PREHISTORIC ARTIFACT TABLES

Table 1. Prehistoric Artifact Inventory by 1 m x 2 m and 1 m x 1 m Test Units, Persimmon Site.

Artifact Catagories	Unit 1														Unit 2																Unit 3															
	L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6						L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.8	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.					#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																														
Proj. Pts./Hafted Knives																																														
Unspecified Bifaces									[1]	1.9											[1]	0.6									[1]	0.4					[1]	3.2								
Informal Flake Tools					1	1.7			2	6.0																											1	3.0								
Formal Flake Tools																																														
Total by Count & Weight					1	1.7			3	7.9											1	0.6									1	0.4					2	6.2								
Frequency					6.25%	3.51%			18.75%	16.32%											6.25%	1.24%									6.25%	0.83%					12.50%	12.81%								
Stone Tool Production & Maintenance Debris																																														
Cores																																														
Amorphous																					1	47.0															1	45.0								
Blanks																																														
Debitage																																														
Primary Decort. Flakes							2	1.9							1	13.8	1	1.6	1	2.1	1	4.2													1	0.2			3	24.5								
Secondary Decort. Flakes			1	0.1					2	0.6									3	1.4									4	1.6					1	0.4	1	0.2	1	0.2				
Tertiary Flakes			4	2.0	2	1.6	4	2.9	18	15.0	1	0.4					5	2.1	1	0.1	4	1.4			1	0.3	3	1.6	3	0.8	7	3.5	11	7.6	13	10.4	2	0.6	1	0.2				
Biface-1 Flakes	1	0.1	2	0.8	2	0.5	3	1.8	12	6.0			1	0.2	1	0.9	4	3.7	1	0.4	7	3.6	4	5.0			6	2.4	5	5.3	3	1.1	12	3.8	8	5.3	4	1.4						
Biface-2 Flakes			4	0.3	2	0.2	13	1.2	56	5.5	9	1.0	2	0.1	2	0.3	8	0.8	12	1.2	27	3.0	7	0.7			24	2.4	18	1.9	17	2.1	41	4.9	24	3.2	10	1.1	7	1.3	2	0.4		
Broken Flakes			5	0.7	5	0.5	20	3.7	54	10.1	16	1.6	1	0.1	3	0.2	16	3.4	19	2.1	30	9.0	3	0.4	1	0.1	23	2.9	17	3.3	25	4.7	28	9.5	30	14.2	12	2.8	9	1.4	1	0.3		
Angular Fragments			1	0.2			3	1.4	3	1.4											4	4.3					4	5.3	1	0.1	3	0.8	4	9.7	6	5.1			1	0.2				
Thermal Shatter							1	0.5	2	0.6	2	0.7							1	0.4	2	0.5	3	1.9			3	0.6	4	0.9	4	1.9	9	14.2	4	1.4	3	0.6						
Heating & Cooking Debris																																														
Cracked Rock																																														
Sandstone							1	-	4	-			1	-																																
Igneous/Metamorphic											1	-			1	-																														
Unmodified Cobbles																																														
Domestic Equipment																																														
Pottery			1	-					5	-					1	-	1	-	3	-	5	-	8	-			2	-	6	-	4	-	18	-	12	-								
Total by Count & Weight	1	0.1	18	4.1	11	2.8	47	13.4	156	39.2	29	3.7	5	0.4	9	15.2	35	11.6	41	7.7	81	73.0	25	8.0	2	0.4	69	16.8	55	12.5	63	14.1	128	119.6	99	39.8	32	6.7	18	3.1	3	0.7
Frequency	0.03%	0.01%	0.51%	0.35%	0.31%	0.24%	1.33%	1.14%	4.41%	3.32%	0.82%	0.31%	0.14%	0.03%	0.25%	1.29%	0.99%	0.98%	1.16%	0.65%	2.29%	6.19%	0.71%	0.68%	0.06%	0.03%	1.95%	1.42%	1.55%	1.06%	1.78%	1.20%	3.61%	10.14%	2.80%	3.37%	0.90%	0.57%	0.51%	0.26%	0.08%	0.06%
Overall Total	1	0.1	18	4.1	12	4.5	47	13.4	159	47.1	29	3.7	5	0.4	9	15.2	35	11.6	41	7.7	82	73.6	25	8.0	2	0.4	70	17.2	55	12.5	63	14.1	130	125.8	99	39.8	32	6.7	18	3.1	3	0.7
Overall Frequency	0.03%	0.01%	0.51%	0.33%	0.34%	0.37%	1.32%	1.09%	4.47%	3.83%	0.82%	0.30%	0.14%	0.03%	0.25%	1.24%	0.98%	0.94%	1.15%	0.63%	2.31%	5.99%	0.70%	0.65%	0.06%	0.03%	1.97%	1.40%	1.55%	1.02%	1.77%	1.15%	3.65%	10.24%	2.78%	3.24%	0.90%	0.55%	0.51%	0.25%	0.08%	0.06%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 1. Cont.

Artifact Catagories	Unit 4																Unit 5														Unit 6															
	L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.8		L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6		L.7	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																														
Proj. Pts./Hafted Knives																																														
Unspecified Bifaces																	[1]	1.1																													
Informal Flake Tools																	1	7.0																													
Formal Flake Tools																															1	0.1													
Total by Count & Weight																	2	8.1													1	0.1													
Frequency																	12.50%	16.74%													6.25%	0.21%													
Stone Tool Production & Maintenance Debris																																														
Cores																																														
Amorphous																							1	16.9																							
Blanks																																														
Debitage																																														
Primary Decort. Flakes					3	6.7	4	7.3	1	0.8	3	1.0	1	0.2					2	7.4	3	8.2	10	16.4	1	1.0	1	0.2			1	1.1	1	1.0			1	5.8								
Secondary Decort. Flakes			2	0.8					2	0.7	2	1.5	3	0.4					2	0.9	2	2.3	7	2.9	1	0.1					2	0.8			1	3.6	1	0.2						
Tertiary Flakes			6	8.5	3	1.7	8	14.7	13	5.3	6	3.4	3	1.5			2	0.5	6	1.6	13	18.0	30	12.4	11	4.5	3	0.5	1	0.4	6	1.6	2	1.0	5	2.9	8	6.8	4	1.3	1	0.2	1	0.7
Biface-1 Flakes			4	0.7	4	1.3	4	2.0	9	5.0	8	1.7	10	2.1			1	3.0	5	1.7	20	7.1	25	7.6	5	1.2	2	0.6	2	0.4	9	2.1	6	4.3	7	2.5	11	3.5	4	0.8	3	0.8	2	0.6
Biface-2 Flakes			14	1.4	5	0.5	28	2.9	49	5.7	29	2.8	31	2.1	1	0.1	5	0.5	16	1.6	35	3.9	87	8.1	12	1.0	13	0.9	5	0.3	10	1.3	6	0.5	13	1.3	22	2.6	8	1.2	10	1.0	5	0.6
Broken Flakes	1	0.1	16	2.5	37	6.4	40	7.7	50	9.0	27	2.4	18	2.2			2	0.2	25	4.9	55	12.6	126	24.2	38	4.6	18	2.5	6	0.7	16	2.9	14	1.9	19	3.7	43	11.4	14	2.1	11	1.1	4	0.5
Angular Fragments			3	0.8	2	0.5	5	1.4	3	2.0	3	1.0					1	0.7	2	0.5	8	6.2	12	5.7	3	0.5	1	0.3	1	0.1	4	2.8	2	0.9	2	0.7	12	9.8	1	0.5	4	1.0	1	3.5
Thermal Shatter			3	1.6	1	0.4	5	1.3	1	0.2	3	0.1	3	2.7					2	0.4	9	6.6	22	20.6	4	1.5	2	0.8	1	0.1	1	0.8	7	2.8	4	0.6	8	17.2	2	0.7				
Heating & Cooking Debris																																														
Cracked Rock																																														
Sandstone																	1	-	1	-			2	-	1	-																				
Igneous/Metamorphic																					1	-									1	-							1	-					
Unmodified Cobbles																																														
Domestic Equipment																																														
Pottery					4	-	7	-	5	-	3	-					3	-	5	-	7	-	37	-	4	-							4	-	8	-	14	-	2	-					
Total by Count & Weight	1	0.1	48	16.3	59	17.5	101	37.3	133	28.7	84	13.9	69	11.2	1	0.1	15	4.9	66	19.0	153	64.9	359	114.8	80	14.4	40	5.8	16	2.0	50	13.4	42	12.4	59	15.3	121	57.3	35	6.6	29	4.1	13	5.9
Frequency	0.03%	0.01%	1.36%	1.38%	1.67%	1.48%	2.85%	3.16%	3.76%	2.43%	2.37%	1.18%	1.95%	0.95%	0.03%	0.01%	0.42%	0.42%	1.86%	1.61%	4.32%	5.50%	10.14%	9.73%	2.26%	1.22%	1.13%	0.49%	0.45%	0.17%	1.41%	1.14%	1.19%	1.05%	1.67%	1.30%	3.42%	4.86%	0.99%	0.56%	0.82%	0.35%	0.37%	0.50%
Overall Total	1	0.1	48	16.3	59	17.5	101	37.3	133	28.7	84	13.9	69	11.2	1	0.1	17	13.0	66	19.0	153	64.9	359	114.8	80	14.4	40	5.8	16	2.0	51	13.5	42	12.4	59	15.3	121	57.3	35	6.6	29	4.1	13	5.9
Overall Frequency	0.03%	0.01%	1.35%	1.33%	1.66%	1.42%	2.84%	3.04%	3.74%	2.34%	2.36%	1.13%	1.94%	0.91%	0.03%	0.01%	0.48%	1.06%	1.86%	1.55%	4.30%	5.28%	10.09%	9.35%	2.25%	1.17%	1.12%	0.47%	0.45%	0.16%	1.43%	1.10%	1.18%	1.01%	1.66%	1.25%	3.40%	4.67%	0.98%	0.54%	0.82%	0.33%	0.37%	0.48%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 1. Cont'd.

Artifact Catagories	Unit 7										Unit 8												Unit 9											
	L.1		L.2		L.3		L.4		L.5		L.1		L.2		L.3		L.4		L.5		L.6		L.1		L.2		L.3		L.4		L.5		L.6	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																		
Proj. Pts./Hafted Knives																									[1]	0.7								
Unspecified Bifaces																																		
Informal Flake Tools																																		
Formal Flake Tools																																		
Total by Count & Weight																									1	0.7								
Frequency																									6.25%	1.45%								
Stone Tool Production & Maintenance Debris																																		
Cores																																		
Amorphous																																		
Blanks																			[1]	28.3														
Debitage																																		
Primary Decort. Flakes					1	1.9	1	0.9											4	4.5							2	10.6	2	0.8	2	1.4	1	0.3
Secondary Decort. Flakes					1	0.1	3	2.2																	1	1.4					1	0.1		
Tertiary Flakes	1	1.7	5	7.3	4	3.0	10	11.0	5	5.2			1	0.8	4	1.3	1	0.2	5	7.9	1	0.5			6	2.7	4	1.1	9	3.0	5	2.6		
Biface-1 Flakes			4	1.0	4	1.1	11	7.4	1	2.6			2	0.5	2	0.3	8	6.0	13	6.7					7	1.4	5	1.2	11	5.7	6	2.3	1	0.2
Biface-2 Flakes	7	0.8	5	0.5	8	0.9	13	1.2	1	0.1			3	0.3	2	0.2	19	1.9	43	2.5					6	0.4	17	1.5	27	2.3	14	1.2	3	0.2
Broken Flakes	8	1.0	11	1.2	13	3.4	17	5.3	8	2.2	1	0.3	1	0.2	11	1.9	18	2.7	31	5.2			1	0.1	16	3.4	21	4.2	24	4.1	13	1.5	4	0.4
Angular Fragments							1	0.2									2	1.6							1	1.6			3	4.5				
Thermal Shatter			1	0.4	2	0.9	2	1.0									1	0.3	1	0.2					1	1.9	3	2.9	8	4.6	3	0.7		
Heating & Cooking Debris																																		
Cracked Rock																																		
Sandstone																											2	-						
Igneous/Metamorphic																																		
Unmodified Cobbles																																		
Domestic Equipment																																		
Pottery	2	-	4	-	6	-	29	-	11	-	1	-	3	-	1	-	1	-	4	-			1	-	4	-	3	-	17	-	4	-	1	-
Total by Count & Weight	18	3.5	30	10.4	39	11.3	87	29.2	26	10.1	2	0.3	10	1.8	20	3.7	50	12.7	102	55.3	1	0.5	2	0.1	42	12.8	57	21.5	101	25.0	48	9.8	10	1.1
Frequency	0.51%	0.30%	0.85%	0.88%	1.10%	0.96%	2.46%	2.47%	0.73%	0.86%	0.06%	0.03%	0.28%	0.15%	0.56%	0.31%	1.41%	1.08%	2.88%	4.69%	0.03%	0.04%	0.06%	0.01%	1.19%	1.08%	1.61%	1.82%	2.85%	2.12%	1.36%	0.83%	0.28%	0.09%
Overall Total	18	3.5	30	10.4	39	11.3	87	29.2	26	10.1	2	0.3	10	1.8	20	3.7	50	12.7	102	55.3	1	0.5	2	0.1	43	13.5	57	21.5	101	25.0	48	9.8	10	1.1
Overall Frequency	0.51%	0.28%	0.84%	0.85%	1.10%	0.92%	2.45%	2.38%	0.73%	0.82%	0.06%	0.02%	0.28%	0.15%	0.56%	0.30%	1.41%	1.03%	2.87%	4.50%	0.03%	0.04%	0.06%	0.01%	1.21%	1.10%	1.60%	1.75%	2.84%	2.04%	1.35%	0.80%	0.28%	0.09%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 1. Cont'd.

Artifact Catagories	Unit 10														Unit 11		Unit 12		Total	
	L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2			
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Proj. Pts./Hafted Knives																			4	4.9
Unspecified Bifaces			[1]	2.0			[1]	4.7											4	9.7
Informal Flake Tools					1	12.8	1	3.2											7	33.7
Formal Flake Tools																			1	0.1
Total by Count & Weight			1	2.0	1	12.8	2	7.9											16	48.4
Frequency			6.25%	4.13%	6.25%	26.45%	12.50%	16.32%											100.00%	100.00%
Stone Tool Production & Maintenance Debris																				
Cores																				
Amorphous																			3	108.9
Blanks																			1	28.3
Debitage																				
Primary Decort. Flakes			2	4.7	3	0.9	1	2.2											61	133.6
Secondary Decort. Flakes					1	0.4	5	0.9											50	23.8
Tertiary Flakes	2	0.4			9	4.1	8	7.8	9	3.9	4	1.1	1	0.3			1	0.2	307	204.1
Biface-1 Flakes	1	0.2	2	1.1	13	6.1	19	9.9	10	3.5	1	0.2	2	0.5					340	149.2
Biface-2 Flakes	2	0.1	4	0.4	22	2.1	17	1.7	8	1.0	11	0.9	4	0.3					925	92.4
Broken Flakes	3	0.2	9	1.6	39	8.4	53	14.5	31	4.9	11	1.6	9	1.3	1	3.6			1252	247.8
Angular Fragments					1	0.3	3	5.7	4	1.1	1	0.9							116	83.3
Thermal Shatter			1	0.8	5	5.1	9	5.0	3	2.0									156	108.4
Heating & Cooking Debris																				
Cracked Rock																			11	-
Sandstone							1	-											8	-
Igneous/Metamorphic																				
Unmodified Cobbles					1	-													2	-
Domestic Equipment																				
Pottery					1	-	34	-	12	-	1	-							309	-
Total by Count & Weight	8	0.9	18	8.6	95	27.4	150	47.7	77	16.4	29	4.7	16	2.4	1	3.6	1	0.2	3541	1179.8
Frequency	0.23%	0.08%	0.51%	0.73%	2.68%	2.32%	4.24%	4.04%	2.17%	1.39%	0.82%	0.40%	0.45%	0.20%	0.03%	0.31%	0.03%	0.02%	100.00%	100.00%
Overall Total	8	0.9	19	10.6	96	40.2	152	55.6	77	16.4	29	4.7	16	2.4	1	3.6	1	0.2	3557	1228.2
Overall Frequency	0.22%	0.07%	0.53%	0.86%	2.70%	3.27%	4.27%	4.53%	2.16%	1.34%	0.82%	0.38%	0.45%	0.20%	0.03%	0.29%	0.03%	0.02%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 2. Prehistoric Artifact Inventory by .5 m x .5 m Test Units (Terrace), Persimmon Site.

Artifact Catagories	Unit E4														Unit F4														Unit G4													
	L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.8	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																										
Proj. Pts./Hafted Knives																																										
Unspecified Bifaces																																							[1]	4.8			
Formal Flake Tools																																											
Total by Count & Weight																																							1	4.8			
Frequency																																							25.00%	11.97%			
Stone Tool Production & Maintenance Debris																																										
Cores																																										
Amorphous																																										
Debitage																																										
Primary Decort. Flakes																					1	0.3			1	0.2											1	1.1					
Secondary Decort. Flakes											1	1.2																													1	0.2		
Tertiary Flakes			2	0.9	1	0.2	4	0.8					1	0.1	3	0.4	1	0.4							5	1.7				1	0.2	1	0.3			4	5.0					
Biface-1 Flakes	1	0.3	2	0.7	1	0.3											2	0.8			1	0.2			2	0.8			1	0.4			1	0.3			4	2.4					
Biface-2 Flakes	3	0.4	3	0.3	4	0.2	4	0.5	3	0.4	1	0.1			2	0.1	1	0.1	5	0.4			3	0.2	5	0.6	1	0.1	2	0.2	1	0.1			1	0.1	4	0.4	10	1.2	5	0.5		
Broken Flakes	1	0.1			2	0.2	8	1.6	2	0.2	2	0.2	1	0.2	3	0.7	3	0.8	3	0.5	3	0.4	2	0.4	6	0.9					3	0.3	3	1.0	1	0.1	6	2.1	5	0.4	1	0.1	1	0.1
Angular Fragments					1	0.2	2	0.4											2	2.7													1	0.8			3	1.9			1	0.3		
Thermal Shatter			1	0.7																																							
Heating & Cooking Debris																																										
Cracked Rock																																										
Igneous/Metamorphic																																										
Domestic Equipment																																										
Pottery					2	-											3	-	2	-	1	-							1	-	1	-	2	-	4	-						
Total by Count & Weight	5	0.8	8	2.6	11	1.1	18	3.3	5	0.6	4	1.5	2	0.3	8	1.2	10	2.1	13	3.9	5	0.6	6	0.8	18	4.0	1	0.1	3	0.6	6	0.6	7	2.4	4	0.2	26	12.9	15	1.6	8	1.1	1	0.1
Frequency	1.17%	0.54%	1.87%	1.76%	2.58%	0.75%	4.22%	2.25%	1.17%	0.41%	0.94%	1.02%	0.47%	0.20%	1.87%	0.81%	2.34%	1.42%	3.04%	2.64%	1.17%	0.41%	1.41%	0.54%	4.22%	2.71%	0.23%	0.07%	0.70%	0.41%	1.41%	0.41%	1.64%	1.63%	0.94%	0.14%	6.09%	8.74%	3.51%	1.08%	1.87%	0.75%	0.23%	0.07%
Overall Total	5	0.8	8	2.6	11	1.1	18	3.3	5	0.6	4	1.5	2	0.3	8	1.2	10	2.1	13	3.9	5	0.6	6	0.8	18	4.0	1	0.1	3	0.6	6	0.6	7	2.4	4	0.2	26	12.9	16	6.4	8	1.1	1	0.1
Overall Frequency	1.16%	0.43%	1.86%	1.39%	2.55%	0.59%	4.18%	1.76%	1.16%	0.32%	0.93%	0.80%	0.46%	0.16%	1.86%	0.64%	2.32%	1.12%	3.02%	2.08%	1.16%	0.32%	1.39%	0.43%	4.18%	2.13%	0.23%	0.05%	0.70%	0.32%	1.39%	0.32%	1.62%	1.28%	0.93%	0.11%	6.03%	6.87%	3.71%	3.41%	1.86%	0.59%	0.23%	0.05%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 2. Cont'd.

Artifact Catagories	Unit H4														Unit J4														Unit J4											
	L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6		L.7		L.1		L.2		L.3		L.4		L.5		L.6	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																								
Proj. Pts./Hafted Knives																					[1]	0.2																		
Unspecified Bifaces					1	8.1																																		
Formal Flake Tools																	1	27.0																						
Total by Count & Weight					1	8.1											1	27.0			1	0.2																		
Frequency					25.00%	20.20%											25.00%	67.33%			25.00%	0.50%																		
Stone Tool Production & Maintenance Debris																																								
Cores																																								
Amorphous																																								
Debitage																																								
Primary Decort. Flakes							2	0.8																																
Secondary Decort. Flakes																															1	0.7								
Tertiary Flakes					1	0.7	1	0.1													2	0.2	1	0.7	4	0.8					1	1.7	1	0.3	2	3.6		
Biface-1 Flakes	1	0.4	1	0.4	1	0.2			4	1.3	2	0.8							1	0.7																	1	0.2	1	0.5
Biface-2 Flakes	2	0.3	3	0.4			2	0.2	1	0.1	4	0.2	1	0.1			1	0.1	1	0.1	5	0.4	2	0.2	1	0.1	5	0.5					1	0.1	1	0.1	1	0.1	1	0.1
Broken Flakes	2	0.2	2	0.2	2	0.4	2	0.2	6	0.8	9	1.6	1	0.1	1	0.1	4	0.6			5	0.7	7	1.1	12	1.4	2	0.3	3	0.5	1	0.1	1	0.1			2	0.4	2	0.6
Angular Fragments									3	8.6			2	0.7							2	0.9					1	0.4									1	0.3	1	0.7
Thermal Shatter							1	6.2	1	0.8															1	0.1	2	0.8											1	0.2
Heating & Cooking Debris																																								
Cracked Rock																																								
Igneous/Metamorphic																																								
Domestic Equipment																																								
Pottery			2	-	1	-			1	-											1	-							1	-										
Total by Count & Weight	5	0.9	8	1.0	5	1.3	8	7.5	16	11.6	15	2.6	4	0.9	1	0.1	5	0.7	2	0.8	15	2.2	10	2.0	18	2.4	10	2.0	4	0.5	1	0.1	4	2.5	2	0.4	7	4.6	6	2.1
Frequency	1.17%	0.61%	1.87%	0.68%	1.17%	0.88%	1.87%	5.08%	3.75%	7.86%	3.51%	1.76%	0.94%	0.61%	0.23%	0.07%	1.17%	0.47%	0.47%	0.54%	3.51%	1.49%	2.34%	1.36%	4.22%	1.63%	2.34%	1.36%	0.94%	0.34%	0.23%	0.07%	0.94%	1.69%	0.47%	0.27%	1.64%	3.12%	1.41%	1.42%
Overall Total	5	0.9	8	1.0	6	9.4	8	7.5	16	11.6	15	2.6	4	0.9	1	0.1	6	27.7	2	0.8	16	2.4	10	2.0	18	2.4	10	2.0	4	0.5	1	0.1	4	2.5	2	0.4	7	4.6	6	2.1
Overall Frequency	1.16%	0.48%	1.86%	0.53%	1.39%	5.01%	1.86%	4.00%	3.71%	6.18%	3.48%	1.39%	0.93%	0.48%	0.23%	0.05%	1.39%	14.76%	0.46%	0.43%	3.71%	1.28%	2.32%	1.07%	4.18%	1.28%	2.32%	1.07%	0.93%	0.27%	0.23%	0.05%	0.93%	1.33%	0.46%	0.21%	1.62%	2.45%	1.39%	1.12%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 2. Cont'd.

Artifact Catagories	Unit K4												Unit H5						Unit I5								Total	
	L.1		L.2		L.3		L.4		L.5		L.6		L.3		L.4		L.5		L.1		L.2		L.3		L.4			
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																												
Proj. Pts./Hafted Knives																											1	0.2
Unspecified Bifaces																											2	12.9
Formal Flake Tools																											1	27.0
Total by Count & Weight																											4	40.1
Frequency																											100.00%	100.00%
Stone Tool Production & Maintenance Debris																												
Cores																												
Amorphous							1	25.0																			1	25.0
Debitage																												
Primary Decort. Flakes																							1	1.0			6	3.4
Secondary Decort. Flakes	1	1.2							1	0.4																	5	3.7
Tertiary Flakes	2	11.0	1	2.0			1	0.5	2	2.1					1	0.3											43	34.0
Biface-1 Flakes	1	0.6	2	0.5			2	0.8	1	0.2							1	0.2	1	0.2							35	13.2
Biface-2 Flakes	3	0.4			3	0.2	5	0.5	1	0.1	2	0.2	1	0.1	2	0.3			1	0.1	2	0.1					109	10.9
Broken Flakes	7	3.0	3	0.3	3	3.0	1	0.1	1	0.1	1	0.2	1	0.1	4	0.4			3	0.9	1	0.1			1	0.1	146	28.0
Angular Fragments	3	0.8	2	0.2	2	0.5																					27	19.4
Thermal Shatter	2	0.4			1	0.3	1	0.4			1	0.1															12	10.0
Heating & Cooking Debris																												
Cracked Rock																												
Igneous/Metamorphic	1	-	1	-																							2	-
Domestic Equipment																												
Pottery	1	-	1	-	5	-	2	-	2	-			1	-	1	-					1	-	2	-	2	-	41	-
Total by Count & Weight	21	17.4	10	3.0	14	4.0	13	27.3	8	2.9	4	0.5	3	0.2	8	1.0	1	0.2	5	1.2	4	0.2	3	1.0	3	0.1	427	147.6
Frequency	4.92%	11.79%	2.34%	2.03%	3.28%	2.71%	3.04%	18.50%	1.87%	1.96%	0.94%	0.34%	0.70%	0.14%	1.87%	0.68%	0.23%	0.14%	1.17%	0.81%	0.94%	0.14%	0.70%	0.68%	0.70%	0.07%	100.00%	100.00%
Overall Total	21	17.4	10	3.0	14	4.0	13	27.3	8	2.9	4	0.5	3	0.2	8	1.0	1	0.2	5	1.2	4	0.2	3	1.0	3	0.1	431	187.7
Overall Frequency	4.87%	9.27%	2.32%	1.60%	3.25%	2.13%	3.02%	14.54%	1.86%	1.55%	0.93%	0.27%	0.70%	0.11%	1.86%	0.53%	0.23%	0.11%	1.16%	0.64%	0.93%	0.11%	0.70%	0.53%	0.70%	0.05%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 3. Prehistoric Artifact Inventory by .5 m x .5 m Test Units (Escarpment), Persimmon Site.

Artifact Catagories	Unit A1				Unit A2				Unit B1		Unit B2		Unit C1				Unit C2		Unit C3		Unit D1		Unit D2		Unit D3				Unit E2				Unit E3			
	L.1		L.2		L.1		L.2		L.1		L.1		L.1		L.2		L.1		L.2		L.1		L.1		L.1		L.2		L.1		L.2		L.1		L.2	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																				
Proj. Pts./Hafted Knives																																				
Informal Flake Tools																																				
Formal Flake Tools																																				
Total by Count & Weight																																				
Frequency																																				
Stone Tool Production & Maintenance Debris																																				
Cores																																				
Amorphous																											1	129.9								
Core Tools																																				
Debitage																																				
Primary Decort. Flakes							1	5.6			1	38.0					1	15.2																		
Secondary Decort. Flakes													1	3.8															2	3.8						
Tertiary Flakes					1	1.1	3	0.9	2	0.6			1	1.9	1	0.2	1	0.4			1	0.2									2	0.7	2	1.1	1	3.8
Biface-1 Flakes					1	0.5	4	2.4			2	1.7	1	0.2									1	1.5	1	0.3					1	0.4				
Biface-2 Flakes	2	0.1					2	0.1	2	0.2											2	0.2	1	0.2	1	0.1	1	0.1	2	0.2			1	0.2		
Broken Flakes	2	0.3			1	0.1	3	0.8	1	0.2	1	0.1	2	0.3	1	0.1	1	0.2					1	0.2	2	0.4	2	0.2			2	0.3	2	0.5	4	3.4
Angular Fragments																																				
Thermal Shatter	1	0.3											2	1.0													2	0.9								
Heating & Cooking Debris																																				
Cracked Rock																																				
Sandstone			1	-							1	-																								
Limestone																																				
Domestic Equipment																																				
Pottery																			2	-													1	-		
Total by Count & Weight	5	0.7	1	-	3	1.7	13	9.8	5	1	5	39.8	7	7.2	2	0.3	3	15.8	2	-	3	0.4	3	1.9	4	0.8	6	131.1	4	4.0	5	1.4	6	1.8	5	7.2
Frequency	1.81%	0.15%	0.36%	0.00%	1.09%	0.36%	4.71%	2.10%	1.81%	0.21%	1.81%	8.53%	2.54%	1.54%	0.72%	0.06%	1.09%	3.39%	0.72%	0.00%	1.09%	0.09%	1.09%	0.41%	1.45%	0.17%	2.17%	28.10%	1.45%	0.86%	1.81%	0.30%	2.17%	0.39%	1.81%	1.54%
Overall Total	5	0.7	1	-	3	1.7	13	9.8	5	1	5	39.8	7	7.2	2	0.3	3	15.8	2	-	3	0.4	3	1.9	4	0.8	6	131.1	4	4.0	5	1.4	6	1.8	5	7.2
Overall Frequency	1.79%	0.14%	0.36%	0.00%	1.08%	0.35%	4.66%	1.99%	1.79%	0.20%	1.79%	8.08%	2.51%	1.46%	0.72%	0.06%	1.08%	3.21%	0.72%	0.00%	1.08%	0.08%	1.08%	0.39%	1.43%	0.16%	2.15%	26.62%	1.43%	0.81%	1.79%	0.28%	2.15%	0.37%	1.79%	1.46%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 3. Cont'd.

Artifact Catagories	Unit F2				Unit F3				Unit G1				Unit G2						Unit G3		Unit H1				Unit H2						Unit H3			
	L.1		L.2		L.2		L.3		L.1		L.2		L.1		L.2		L.3		L.1		L.1		L.2		L.1		L.2		L.3		L.1		L.2	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																																		
Proj. Pts./Hafted Knives															[1]	10.7																		
Informal Flake Tools																									1	14.7								
Formal Flake Tools																																		
Total by Count & Weight															1	10.7									1	14.7								
Frequency															33.33%	41.31%									33.33%	56.76%								
Stone Tool Production & Maintenance Debris																																		
Cores																																		
Amorphous													1	48.5																				
Core Tools	1	46.0																																
Debitage																																		
Primary Decort. Flakes	2	3.4													1	4.6					1	2.1	1	2.6	1	5.2	1	3.3						
Secondary Decort Flakes													1	0.6			1	1.0									1	4.9						
Tertiary Flakes	3	3.3			1	0.2			6	4.1			3	1.9	5	8.0			3	1.2	3	2.0			3	7.2	1	0.7			2	0.9		
Biface-1 Flakes	1	0.5							2	0.9					1	1.2					1	0.9	3	2.0	2	0.9								
Biface-2 Flakes	2	0.5							10	1.0	3	0.4			3	0.4					1	0.1					2	0.1	1	0.2	1	0.1		
Broken Flakes	7	2.2			1	0.4			11	2.0			8	4.8	8	5.0	1	2.0	2	0.4	3	0.6	1	0.2	3	1.9	1	0.5			6	5.0		
Angular Fragments													1	0.6	2	1.2					2	1.9												
Thermal Shatter									1	0.1					2	0.6									1	0.3								
Heating & Cooking Debris																																		
Cracked Rock																																		
Sandstone																					1	8.8			1	-	1	-						
Limestone					1	-	1	-																										
Domestic Equipment																																		
Pottery			1	-	1	-																			4	-	2	-						
Total by Count & Weight	16	55.9	1	-	4	0.6	1	-	30	8.1	3	0.4	14	56.4	22	21.0	2	3.0	5	1.6	12	16.4	5	4.8	15	15.5	9	9.5	1	0.2	8	5.4	2	0.9
Frequency	5.80%	11.98%	0.36%	0.00%	1.45%	0.13%	0.36%	0.00%	10.87%	1.74%	1.09%	0.09%	5.07%	12.09%	7.97%	4.50%	0.72%	0.64%	1.81%	0.34%	4.35%	3.52%	1.81%	1.03%	5.43%	3.32%	3.26%	2.04%	0.36%	0.04%	2.90%	1.16%	0.72%	0.19%
Overall Total	16	55.9	1	-	4	0.6	1	-	30	8.1	3	0.4	14	56.4	23	31.7	2	3.0	5	1.6	12	16.4	5	4.8	16	30.2	9	9.5	1	0.2	8	5.4	2	0.9
Overall Frequency	5.73%	11.35%	0.36%	0.00%	1.43%	0.12%	0.36%	0.00%	10.75%	1.65%	1.08%	0.08%	5.02%	11.45%	8.24%	6.44%	0.72%	0.61%	1.79%	0.32%	4.30%	3.33%	1.79%	0.97%	5.73%	6.13%	3.23%	1.93%	0.36%	0.04%	2.87%	1.10%	0.72%	0.18%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 3. Cont'd.

Artifact Catagories	Unit I1				Unit I2								Unit I3				Unit J1				Unit J2								Total	
	L.1		L.2		L.1		L.2		L.3		L.4		L.1		L.2		L.1		L.2		L.1		L.2		L.3		L.4			
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																														
Proj. Pts./Hafted Knives																													1	10.7
Informal Flake Tools																													1	14.7
Formal Flake Tools	1	0.5																											1	0.5
Total by Count & Weight	1	0.5																											3	25.9
Frequency	33.33%	1.93%																											100.00%	100.00%
Stone Tool Production & Maintenance Debris																														
Cores																														
Amorphous																													2	178.4
Core Tools																													1	46.0
Debitage																														
Primary Decort. Flakes															1	0.6													11	80.6
Secondary Decort. Flakes	1	3.0									1	0.1																	8	17.2
Tertiary Flakes	1	0.4			1	2.9			1	0.1							1	0.2											49	44.0
Biface-1 Flakes							1	0.7									1	0.9											24	15.3
Biface-2 Flakes							1	0.2	1	0.2			1	0.2			1	0.1							1	0.4			42	5.3
Broken Flakes			2	1.2					2	1.5					3	2.8			1	0.7									85	38.3
Angular Fragments																					1	0.7	1	0.4	2	1.7	2	1.5	11	8.0
Thermal Shatter			1	0.8													1	1.0											11	5.0
Heating & Cooking Debris																														
Cracked Rock																														
Sandstone																							2	19.6			1	-	8	28.4
Limestone																													2	-
Domestic Equipment																														
Pottery			1	-					8	-			1	-	1	-													22	-
Total by Count & Weight	2	3.4	4	2	1	2.9	2	0.9	12	1.8	1	0.1	2	0.2	5	3.4	4	2.2	1	0.7	1	0.7	3	20.0	3	2.1	3	1.5	276	466.5
Frequency	0.72%	0.73%	1.45%	0.43%	0.36%	0.62%	0.72%	0.19%	4.35%	0.39%	0.36%	0.02%	0.72%	0.04%	1.81%	0.73%	1.45%	0.47%	0.36%	0.15%	0.36%	0.15%	1.09%	4.29%	1.09%	0.45%	1.09%	0.32%	100.00%	100.00%
Overall Total	3	3.9	4	2	1	2.9	2	0.9	12	1.8	1	0.1	2	0.2	5	3.4	4	2.2	1	0.7	1	0.7	3	20.0	3	2.1	3	1.5	279	492.4
Overall Frequency	1.08%	0.79%	1.43%	0.41%	0.36%	0.59%	0.72%	0.18%	4.30%	0.37%	0.36%	0.02%	0.72%	0.04%	1.79%	0.69%	1.43%	0.45%	0.36%	0.14%	0.36%	0.14%	1.08%	4.06%	1.08%	0.43%	1.08%	0.30%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 4. Prehistoric Artifact Inventory by Mechanical Excavation Block, Persimmon Site.

Artifact Catagories	E./W. Strip. Blk.		North Strip. Blk.		South Strip. Blk.		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools								
Proj. Pts./Hafted Knives					1	8.9	1	8.9
Unspecified Bifaces					[1]	2.6	1	2.6
Informal Flake Tools	2	16.1	1	13.0	5	77.3	8	106.4
Formal Flake Tools					2	35.1	2	35.1
Total by Count & Weight	2	16.1	1	13.0	9	123.9	12	153.0
Frequency	16.67%	10.52%	8.33%	8.50%	75.00%	80.98%	100.00%	100.00%
Stone Tool Production & Maintenance Debris								
Cores								
Amorphous			4	617.7	4	275.0	8	892.7
Blanks			1	42.0	[1]	22.1	2	64.1
Debitage								
Primary Decort. Flakes					1	31.2	1	31.2
Secondary Decort. Flakes					3	49.1	3	49.1
Tertiary Flakes	2	15.9	1	8.5	13	109.9	16	134.3
Biface-1 Flakes	1	1.5	3	4.9	8	17.4	12	23.8
Broken Flakes					9	19.8	9	19.8
Angular Fragments					1	6.5	1	6.5
Thermal Shatter	4	2.5			3	28.5	7	31.0
Domestic Equipment								
Pitted Limestone					1	3693.2	1	3693.2
Pottery	4	35.9	2	19.5	11	115.4	17	170.8
Total by Count & Weight	11	55.8	11	692.6	55	4368.1	77	5116.5
Frequency	14.29%	1.09%	14.29%	13.54%	71.43%	85.37%	100.00%	100.00%
Overall Total	13	71.9	12	705.6	64	4492.0	89	5269.5
Overall Frequency	14.61%	1.36%	13.48%	13.39%	71.91%	85.25%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 5. Prehistoric Artifact Inventory by Feature, Persimmon Site.

Artifact Catagories	Feature 1		Feature 2		Feature 3		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools								
Proj. Pts./Hafted Knives	[1]	1.4					1	1.4
Formal Flake Tools					1	0.2	1	0.2
Total by Count & Weight	1	1.4			1	0.2	2	1.6
Frequency	50.00%	87.50%			50.00%	12.50%	100.00%	100.00%
Stone Tool Production & Maintenance Debris								
Debitage								
Primary Decort. Flakes	3	4.5			1	0.2	4	4.7
Tertiary Flakes	11	11.5			8	19.8	19	31.3
Biface-1 Flakes	2	1.0			6	3.1	8	4.1
Biface-2 Flakes	17	3.6			12	1.6	29	5.2
Broken Flakes	9	1.6			10	2.1	19	3.7
Angular Fragments	2	1.9	1	0.3	4	1.8	7	4.0
Thermal Shatter					1	0.5	1	0.5
Heating & Cooking Debris								
Cracked Rock								
Limestone					1	2.0	1	2.0
Burned Limestone					1	1541.4	1	1541.4
Domestic Equipment								
Pottery	9	23.8			97	693.7	106	717.5
Total by Count & Weight	53	47.9	1	0.3	141	2266.2	195	2314.4
Frequency	27.18%	2.07%	0.51%	0.01%	72.31%	97.92%	100.00%	100.00%
Overall Total	54	49.3	1	0.3	142	2266.4	197	2316.0
Overall Frequency	27.41%	2.13%	0.51%	0.01%	72.08%	97.86%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Chert Identification by Tool and Debitage Catagories, 1 m x 2 m and 1 m x 1 m Test Units, Persimmon Site.

Unit 1																												
	L.1		L.2		L.3		L.4						L.5								L.6						L.7			
Chert Type	Burlington		Burlington		Burlington		Burlington		Cobden		Unidentified		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Unidentified		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																												
Unspecified Bifaces													[1]	1.9															1	1.9
Informal Flake Tools					1	1.7							1	4.7					1	1.3									3	7.7
Total by Count & Weight					1	1.7							2	6.6					1	1.3									4	9.6
Frequency					25.00%	17.71%							50.00%	68.75%					25.00%	13.54%									100.00%	100.00%
Stone Tool Production & Maintenance Debris																														
Debitage																														
Primary Decort. Flakes							1	1.1			1	0.8																	2	1.9
Secondary Decort. Flakes			1	0.1											2	0.6													3	0.7
Tertiary Flakes			4	2.0	2	1.6	4	2.9					16	13.3	1	1.6			1	0.1	1	0.4							29	21.9
Biface-1 Flakes	1	0.1	2	0.8	2	0.5	3	1.8					11	5.7			1	0.3									1	0.2	21	9.4
Biface-2 Flakes			4	0.3	2	0.2	13	1.2					55	5.4	1	0.1					8	0.9	1	0.1			2	0.1	86	8.3
Broken Flakes			5	0.7	5	0.5	16	2.4	4	1.3			47	9.1	3	0.5			4	0.5	15	1.5			1	0.1	1	0.1	101	16.7
Angular Fragments			1	0.2			3	1.4					3	1.4															7	3.0
Thermal Shatter							1	0.5							2	0.6					2	0.7							5	1.8
Total by Count & Weight	1	0.1	17	4.1	11	2.8	41	11.3	4	1.3	1	0.8	132	34.9	9	3.4	1	0.3	5	0.6	26	3.5	1	0.1	1	0.1	4	0.4	254	63.7
Frequency	0.39%	0.16%	6.69%	6.44%	4.33%	4.40%	16.14%	17.74%	1.57%	2.04%	0.39%	1.26%	51.97%	54.79%	3.54%	5.34%	0.39%	0.47%	1.97%	0.94%	10.24%	5.49%	0.39%	0.16%	0.39%	0.16%	1.57%	0.63%	100.00%	100.00%
Overall Total	1	0.1	17	4.1	12	4.5	41	11.3	4	1.3	1	0.8	134	41.5	9	3.4	1	0.3	6	1.9	26	3.5	1	0.1	1	0.1	4	0.4	258	73.3
Overall Frequency	0.39%	0.14%	6.59%	5.59%	4.65%	6.14%	15.89%	15.42%	1.55%	1.77%	0.39%	1.09%	51.94%	56.62%	3.49%	4.64%	0.39%	0.41%	2.33%	2.59%	10.08%	4.77%	0.39%	0.14%	0.39%	0.14%	1.55%	0.55%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 2																		
Chert Type	L.1		L.2								L.3							
	Burlington		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																		
Proj. Pts./Hafted Knives																		
Total by Count & Weight																		
Frequency																		
Stone Tool Production & Maintenance Debris																		
Cores																		
Amorphous																		
Debitage																		
Primary Decort. Flakes	1	13.8	1	1.6									1	2.1				
Secondary Decort. Flakes											2	1.2	1	0.2				
Tertiary Flakes			5	2.1											1	0.1		
Biface-1 Flakes	1	0.9	4	3.7											1	0.4		
Biface-2 Flakes	2	0.3	6	0.6	1	0.1			1	0.1	8	0.8			3	0.3	1	0.1
Broken Flakes	3	0.2	12	2.6	2	0.3	1	0.1	1	0.4	15	1.6					4	0.5
Angular Fragments																		
Thermal Shatter											1	0.4						
Total by Count & Weight	7	15.2	28	10.6	3	0.4	1	0.1	2	0.5	26	4.0	2	2.3	5	0.8	5	0.6
Frequency	4.02%	13.11%	16.09%	9.15%	1.72%	0.35%	0.57%	0.09%	1.15%	0.43%	14.94%	3.45%	1.15%	1.98%	2.87%	0.69%	2.87%	0.52%
Overall Total	7	15.2	28	10.6	3	0.4	1	0.1	2	0.5	26	4.0	2	2.3	5	0.8	5	0.6
Overall Frequency	4.00%	13.05%	16.00%	9.10%	1.71%	0.34%	0.57%	0.09%	1.14%	0.43%	14.86%	3.43%	1.14%	1.97%	2.86%	0.69%	2.86%	0.52%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Unit 2 (Cont'd.)																				
Chert Type	L.4								L.5						L.6				Total	
	Burlington		Chouteau		Cobden		Kaolin		Chouteau		Cobden		Kaolin		Burlington		Cobden			
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Proj. Pts./Hafted Knives	[1]	0.6																	1	0.6
Total by Count & Weight	1	0.6																	1	0.6
Frequency	100.00%	100.00%																	100.00%	100.00%
Stone Tool Production & Maintenance Debris																				
Cores																				
Amorphous	1	47.0																	1	47.0
Debitage																				
Primary Decort. Flakes	1	4.2																	4	21.7
Secondary Decort. Flakes																			3	1.4
Tertiary Flakes	2	1.0					2	0.4									1	0.3	11	3.9
Biface-1 Flakes	6	2.7			1	0.9					4	5.0							17	13.6
Biface-2 Flakes	23	2.5	2	0.2	2	0.3			3	0.3	3	0.3	1	0.1					56	6.0
Broken Flakes	27	8.3			3	0.7			1	0.2	1	0.1	1	0.1	1	0.1			72	15.2
Angular Fragments	3	2.0					1	2.3											4	4.3
Thermal Shatter			2	0.5					3	1.9									6	2.8
Total by Count & Weight	63	67.7	4	0.7	6	1.9	3	2.7	7	2.4	8	5.4	2	0.2	1	0.1	1	0.3	174	115.9
Frequency	36.21%	58.41%	2.30%	0.60%	3.45%	1.64%	1.72%	2.33%	4.02%	2.07%	4.60%	4.66%	1.15%	0.17%	0.57%	0.09%	0.57%	0.26%	100.00%	100.00%
Overall Total	64	68.3	4	0.7	6	1.9	3	2.7	7	2.4	8	5.4	2	0.2	1	0.1	1	0.3	175	116.5
Overall Frequency	36.57%	58.63%	2.29%	0.60%	3.43%	1.63%	1.71%	2.32%	4.00%	2.06%	4.57%	4.64%	1.14%	0.17%	0.57%	0.09%	0.57%	0.26%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 3																						
Chert Type	L.1						L.2								L.3							
	Burlington		Chouteau		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																						
Proj. Pts./Hafted Knives	[1]	0.4																				
Informal Flake Tools																						
Total by Count & Weight	1	0.4																				
Frequency	33.33%	6.06%																				
Stone Tool Production & Maintenance Debris																						
Cores																						
Amorphous																						
Debitage																						
Primary Decort. Flakes									1	0.2												
Secondary Decort. Flakes	2	0.3	2	1.3																		
Tertiary Flakes	2	1.4	1	0.2			2	0.7			1	0.1			7	3.5						
Biface-1 Flakes	5	2.1	1	0.3			4	4.0					1	1.3	2	0.6					1	0.5
Biface-2 Flakes	23	2.3	1	0.1			14	1.4	1	0.1	1	0.1	2	0.3	13	1.4	1	0.2	3	0.5		
Broken Flakes	21	2.6			2	0.3	10	1.4	2	0.2			5	1.7	19	3.8	3	0.6	2	0.2	1	0.1
Angular Fragments	3	5.1			1	0.2							1	0.1	2	0.4			1	0.4		
Thermal Shatter	2	0.4	1	0.2			3	0.6					1	0.3	2	1.6	1	0.2	1	0.1		
Total by Count & Weight	58	14.2	6	2.1	3	0.5	33	8.1	4	0.5	2	0.2	10	3.7	45	11.3	5	1.0	7	1.2	2	0.6
Frequency	13.68%	6.66%	1.42%	0.98%	0.71%	0.23%	7.78%	3.80%	0.94%	0.23%	0.47%	0.09%	2.36%	1.73%	10.61%	5.30%	1.18%	0.47%	1.65%	0.56%	0.47%	0.28%
Overall Total	59	14.6	6	2.1	3	0.5	33	8.1	4	0.5	2	0.2	10	3.7	45	11.3	5	1.0	7	1.2	2	0.6
Overall Frequency	13.82%	6.64%	1.41%	0.95%	0.70%	0.23%	7.73%	3.68%	0.94%	0.23%	0.47%	0.09%	2.34%	1.68%	10.54%	5.14%	1.17%	0.45%	1.64%	0.55%	0.47%	0.27%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Unit 3 (Cont'd.)																												
Chert Type	L.4										L.5								L.6				L.7		L.8			
	Burlington		Chouteau		Cobden		Foss. Kinkaid		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Burlington		Kaolin		Burlington		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																												
Proj. Pts./Hafted Knives	[1]	3.2																									2	3.6
Informal Flake Tools					1	3.0																					1	3.0
Total by Count & Weight	1	3.2			1	3.0																					3	6.6
Frequency	33.33%	48.48%			33.33%	45.45%																					100.00%	100.00%
Stone Tool Production & Maintenance Debris																												
Cores																												
Amorphous	1	45.0																									1	45.0
Debitage																												
Primary Decort. Flakes	3	24.5																									4	24.7
Secondary Decort. Flakes	1	0.4															1	0.2			1	0.2					7	2.4
Tertiary Flakes	9	6.9	2	0.7							11	9.8	1	0.4			1	0.2	1	0.2	1	0.4	1	0.2			40	24.7
Biface-1 Flakes	10	3.1	1	0.3			1	0.4			8	5.3							4	1.4							38	19.3
Biface-2 Flakes	28	3.3	8	0.8	1	0.2			4	0.6	22	3.0					2	0.2	10	1.1			7	1.3	2	0.4	143	17.3
Broken Flakes	22	5.1	4	3.8	1	0.4			1	0.2	29	14.0			1	0.2			11	1.4	1	1.4	9	1.4	1	0.3	145	39.1
Angular Fragments	4	9.7									6	5.1											1	0.2			19	21.2
Thermal Shatter	7	14.0	1	0.1					1	0.1	3	0.8	1	0.6					3	0.6							27	19.6
Total by Count & Weight	85	112.0	16	5.7	2	0.6	1	0.4	6	0.9	79	38.0	2	1.0	2	0.4	3	0.4	30	4.9	2	1.8	18	3.1	3	0.7	424	213.3
Frequency	20.05%	52.51%	3.77%	2.67%	0.47%	0.28%	0.24%	0.19%	1.42%	0.42%	18.63%	17.82%	0.47%	0.47%	0.47%	0.19%	0.71%	0.19%	7.08%	2.30%	0.47%	0.84%	4.25%	1.45%	0.71%	0.33%	100.00%	100.00%
Overall Total	86	115.2	16	5.7	3	3.6	1	0.4	6	0.9	79	38.0	2	1.0	2	0.4	3	0.4	30	4.9	2	1.8	18	3.1	3	0.7	427	219.9
Overall Frequency	20.14%	52.39%	3.75%	2.59%	0.70%	1.64%	0.23%	0.18%	1.41%	0.41%	18.50%	17.28%	0.47%	0.45%	0.47%	0.18%	0.70%	0.18%	7.03%	2.23%	0.47%	0.82%	4.22%	1.41%	0.70%	0.32%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 4																														
	L.1		L.2						L.3										L.4											
Chert Type	Burlington		Burlington		Chouteau		Cobden		Burlington		Chouteau		Cobden		Kaolin		Unidentified		Burlington		Chouteau		Cobden		Kaolin		Ste. Genevieve		Unidentified	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																														
Debitage																														
Primary Decort. Flakes									3	6.7									3	2.0									1	5.3
Secondary Decort. Flakes			2	0.8																										
Tertiary Flakes			5	2.3	1	6.2			3	1.7									8	14.7										
Biface-1 Flakes			3	0.5			1	0.2	4	1.3									1	0.3	1	0.9	1	0.3			1	0.5		
Biface-2 Flakes			13	1.2	1	0.2					1	0.1			4	0.4			24	2.6	2	0.1			1	0.1	1	0.1		
Broken Flakes	1	0.1	16	2.5					26	4.3	3	0.3	1	0.5	6	0.4	1	0.9	35	7.2	2	0.2	3	0.3						
Angular Fragments			3	0.8					2	0.5									5	1.4										
Thermal Shatter			2	1.5	1	0.1					1	0.4							5	1.3										
Total by Count & Weight	1	0.1	44	9.6	3	6.5	1	0.2	38	14.5	5	0.8	1	0.5	10	0.8	1	0.9	81	29.5	5	1.2	4	0.6	1	0.1	2	0.6	1	5.3
Frequency	0.21%	0.08%	9.22%	7.67%	0.63%	5.20%	0.21%	0.16%	7.97%	11.59%	1.05%	0.64%	0.21%	0.40%	2.10%	0.64%	0.21%	0.72%	16.98%	23.58%	1.05%	0.96%	0.84%	0.48%	0.21%	0.08%	0.42%	0.48%	0.21%	4.24%
Overall Total	1	0.1	44	9.6	3	6.5	1	0.2	38	14.5	5	0.8	1	0.5	10	0.8	1	0.9	81	29.5	5	1.2	4	0.6	1	0.1	2	0.6	1	5.3
Overall Frequency	0.21%	0.08%	9.22%	7.67%	0.63%	5.20%	0.21%	0.16%	7.97%	11.59%	1.05%	0.64%	0.21%	0.40%	2.10%	0.64%	0.21%	0.72%	16.98%	23.58%	1.05%	0.96%	0.84%	0.48%	0.21%	0.08%	0.42%	0.48%	0.21%	4.24%

Key: # = Count, Wt. = Weight in Grams

Unit 4 (Cont'd.)																												
	L.5								L.6										L.7						L.8			
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Foss. Kinkaid		Kaolin		Burlington		Chouteau		Cobden		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																												
Debitage																												
Primary Decort. Flakes	1	0.8							2	0.8	1	0.2							1	0.2							12	16.0
Secondary Decort. Flakes	2	0.7							2	1.5									3	0.4							9	3.4
Tertiary Flakes	8	3.3	3	0.9			2	1.1	5	3.2	1	0.2							1	0.2	2	1.3					39	35.1
Biface-1 Flakes	9	5.0							7	1.4					1	0.3			8	1.8	2	0.3					39	12.8
Biface-2 Flakes	39	4.4	3	0.5			7	0.8	25	2.4	1	0.1	1	0.1			2	0.2	30	2.0	1	0.1			1	0.1	157	15.5
Broken Flakes	41	7.2	6	0.9	1	0.1	2	0.8	20	1.7	3	0.3					4	0.4	15	1.7	2	0.4	1	0.1			189	30.3
Angular Fragments	2	1.5	1	0.5					3	1.0																	16	5.7
Thermal Shatter	1	0.2							3	0.1									3	2.7							16	6.3
Total by Count & Weight	103	23.1	13	2.8	1	0.1	11	2.7	67	12.1	6	0.8	1	0.1	1	0.3	6	0.6	61	9.0	7	2.1	1	0.1	1	0.1	477	125.1
Frequency	21.59%	18.47%	2.73%	2.24%	0.21%	0.08%	2.31%	2.16%	14.05%	9.67%	1.26%	0.64%	0.21%	0.08%	0.21%	0.24%	1.26%	0.48%	12.79%	7.19%	1.47%	1.68%	0.21%	0.08%	0.21%	0.08%	100.00%	100.00%
Overall Total	103	23.1	13	2.8	1	0.1	11	2.7	67	12.1	6	0.8	1	0.1	1	0.3	6	0.6	61	9.0	7	2.1	1	0.1	1	0.1	477	125.1
Overall Frequency	21.59%	18.47%	2.73%	2.24%	0.21%	0.08%	2.31%	2.16%	14.05%	9.67%	1.26%	0.64%	0.21%	0.08%	0.21%	0.24%	1.26%	0.48%	12.79%	7.19%	1.47%	1.68%	0.21%	0.08%	0.21%	0.08%	100.00%	100.00%

Key: # = Count, Wt. = Weight in Grams

Table 6. Cont'd.

Unit 5																														
	L.1		L.2								L.3								L.4											
Chert Type	Burlington		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Ste. Genevieve		Unidentified	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																														
Unspecified Bifaces																			[1]	1.1										
Informal Flake Tools																			1	7.0										
Total by Count & Weight																			2	8.1										
Frequency																			100.00%	100.00%										
Stone Tool Production & Maintenance Debris																														
Cores																														
Amorphous																			1	16.9										
Debitage																														
Primary Decort. Flakes			2	7.4							2	8.0	1	0.2					6	2.4									4	14.2
Secondary Decort. Flakes					2	0.9							2	2.3					4	2.5	2	0.2			1	0.2				
Tertiary Flakes	2	0.5	5	1.0					1	0.6	11	16.8	2	1.0					25	11.1	3	0.9	1	0.1	1	0.3				
Biface-1 Flakes	1	3.0	5	1.7							18	6.3	1	0.6	1	0.2			23	6.8	2	0.8								
Biface-2 Flakes	5	0.5	14	1.4			2	0.2			32	3.5					3	0.4	81	7.3	3	0.3	1	0.1	2	0.4				
Broken Flakes	2	0.2	24	4.7					1	0.2	47	10.0	2	1.0	1	0.1	5	1.5	109	19.2	9	2.2	3	1.8	4	0.9	1	0.1		
Angular Fragments	1	0.7	2	0.5							6	5.8	1	0.4			1	0.2	11	5.5					1	0.2				
Thermal Shatter					2	0.4					7	6.0	2	0.6					19	15.6	3	5.0								
Total by Count & Weight	11	4.9	52	16.7	4	1.3	2	0.2	2	0.8	123	56.4	11	6.1	2	0.3	9	2.1	279	87.3	22	9.4	5	2.0	9	2.0	1	0.1	4	14.2
Frequency	1.65%	2.17%	7.80%	7.39%	0.60%	0.58%	0.30%	0.09%	0.30%	0.35%	18.44%	24.96%	1.65%	2.70%	0.30%	0.13%	1.35%	0.93%	41.83%	38.63%	3.30%	4.16%	0.75%	0.88%	1.35%	0.88%	0.15%	0.04%	0.60%	6.28%
Overall Total	11	4.9	52	16.7	4	1.3	2	0.2	2	0.8	123	56.4	11	6.1	2	0.3	9	2.1	281	95.4	22	9.4	5	2.0	9	2.0	1	0.1	4	14.2
Overall Frequency	1.64%	2.09%	7.77%	7.13%	0.60%	0.56%	0.30%	0.09%	0.30%	0.34%	18.39%	24.09%	1.64%	2.61%	0.30%	0.13%	1.35%	0.90%	42.00%	40.75%	3.29%	4.02%	0.75%	0.85%	1.35%	0.85%	0.15%	0.04%	0.60%	6.07%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Unit 5 (Cont'd.)																				
	L.5								L.6								L.7			
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Unspecified Bifaces																			1	1.1
Informal Flake Tools																			1	7.0
Total by Count & Weight																			2	8.1
Frequency																			100.00%	100.00%
Stone Tool Production & Maintenance Debris																				
Cores																				
Amorphous																			1	16.9
Debitage																				
Primary Decort. Flakes			1	1.0					1	0.2									17	33.4
Secondary Decort. Flakes	1	0.1																	12	6.2
Tertiary Flakes	8	2.5	1	1.4			2	0.6	1	0.2					2	0.3	1	0.4	66	37.7
Biface-1 Flakes	5	1.2							2	0.6							2	0.4	60	21.6
Biface-2 Flakes	9	0.6			1	0.1	2	0.3	11	0.7	1	0.1	1	0.1			5	0.3	173	16.3
Broken Flakes	33	4.0	1	0.1	2	0.3	2	0.2	14	2.0			1	0.2	3	0.3	6	0.7	270	49.7
Angular Fragments	1	0.2	1	0.1			1	0.2	1	0.3							1	0.1	28	14.2
Thermal Shatter	4	1.5							2	0.8							1	0.1	40	30
Total by Count & Weight	61	10.1	4	2.6	3	0.4	7	1.3	32	4.8	1	0.1	2	0.3	5	0.6	16	2.0	667	226.0
Frequency	9.15%	4.47%	0.60%	1.15%	0.45%	0.18%	1.05%	0.58%	4.80%	2.12%	0.15%	0.04%	0.30%	0.13%	0.75%	0.27%	2.40%	0.88%	100.00%	100.00%
Overall Total	61	10.1	4	2.6	3	0.4	7	1.3	32	4.8	1	0.1	2	0.3	5	0.6	16	2.0	669	234.1
Overall Frequency	9.12%	4.31%	0.60%	1.11%	0.45%	0.17%	1.05%	0.56%	4.78%	2.05%	0.15%	0.04%	0.30%	0.13%	0.75%	0.26%	2.39%	0.85%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 6																						
	L.1								L.2				L.3									
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Burlington		Chouteau		Cobden		Kaolin		Foss. Kinkaid	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																						
Formal Flake Tools	1	0.1																				
Total by Count & Weight	1	0.1																				
Frequency	100.00%	100.00%																				
Stone Tool Production & Maintenance Debris																						
Debitage																						
Primary Decort. Flakes	1	1.1							1	1.0												
Secondary Decort. Flakes	1	0.1	1	0.7									1	3.6								
Tertiary Flakes	5	1.5	1	0.1					2	1.0			4	1.9					1	1.0		
Biface-1 Flakes	9	2.1							5	4.0	1	0.3	7	2.5								
Biface-2 Flakes	9	1.2					1	0.1	5	0.4	1	0.1	12	1.2							1	0.1
Broken Flakes	13	2.4	2	0.4	1	0.1			14	1.9			16	3.0	1	0.1	2	0.6				
Angular Fragments	4	2.8							2	0.9			1	0.4					1	0.3		
Thermal Shatter	1	0.8							6	2.3	1	0.5	3	0.5	1	0.1						
Total by Count & Weight	43	12.0	4	1.2	1	0.1	1	0.1	35	11.5	3	0.9	44	13.1	2	0.2	2	0.6	2	1.3	1	0.1
Frequency	13.48%	10.47%	1.25%	1.05%	0.31%	0.09%	0.31%	0.09%	10.97%	10.03%	0.94%	0.79%	13.79%	11.43%	0.63%	0.17%	0.63%	0.52%	0.63%	1.13%	0.31%	0.09%
Overall Total	44	12.1	4	1.2	1	0.1	1	0.1	35	11.5	3	0.9	44	13.1	2	0.2	2	0.6	2	1.3	1	0.1
Overall Frequency	13.75%	10.55%	1.25%	1.05%	0.31%	0.09%	0.31%	0.09%	10.94%	10.03%	0.94%	0.78%	13.75%	11.42%	0.63%	0.17%	0.63%	0.52%	0.63%	1.13%	0.31%	0.09%

Key: # = Count; Wt. = Weight in Grams

Unit 6 (Cont'd.)																						
	L.4								L.5						L.6		L.7					
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Burlington		Burlington		Kaolin		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																						
Formal Flake Tools																					1	0.1
Total by Count & Weight																					1	0.1
Frequency																					100.00%	100.00%
Stone Tool Production & Maintenance Debris																						
Debitage																						
Primary Decort. Flakes			1	5.8																	3	7.9
Secondary Decort. Flakes	1	0.2																			4	4.6
Tertiary Flakes	7	5.9					1	0.9	4	1.3					1	0.2	1	0.7			27	14.5
Biface-1 Flakes	10	3.3	1	0.2					4	0.8					3	0.8	2	0.6			42	14.6
Biface-2 Flakes	17	1.9	1	0.2	2	0.2	2	0.3	6	0.9	1	0.2	1	0.1	10	1.0	5	0.6			74	8.5
Broken Flakes	35	9.5	3	1.0			5	0.9	12	1.7	2	0.4			11	1.1	3	0.4	1	0.1	121	23.6
Angular Fragments	9	5.6	3	4.2					1	0.5					4	1.0			1	3.5	26	19.2
Thermal Shatter	4	11.6	4	5.2					1	0.5	1	0.2									22	21.7
Total by Count & Weight	83	38.0	13	16.6	2	0.2	8	2.1	28	5.7	4	0.8	1	0.1	29	4.1	11	2.3	2	3.6	319	114.6
Frequency	26.02%	33.16%	4.08%	14.49%	0.63%	0.17%	2.51%	1.83%	8.78%	4.97%	1.25%	0.70%	0.31%	0.09%	9.09%	3.58%	3.45%	2.01%	0.63%	3.14%	100.00%	100.00%
Overall Total	83	38.0	13	16.6	2	0.2	8	2.1	28	5.7	4	0.8	1	0.1	29	4.1	11	2.3	2	3.6	320	114.7
Overall Frequency	25.94%	33.13%	4.06%	14.47%	0.63%	0.17%	2.50%	1.83%	8.75%	4.97%	1.25%	0.70%	0.31%	0.09%	9.06%	3.57%	3.44%	2.01%	0.63%	3.14%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 6. Cont'd.

Unit 7																										
Chert Type	L.1		L.2				L.3								L.4						L.5					
	Burlington		Burlington		Chouteau		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Kaolin		Burlington		Chouteau		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																										
Debitage																										
Primary Decort. Flakes							1	1.9									1	0.9							2	2.8
Secondary Decort. Flakes							1	0.1									2	1.7	1	0.5					4	2.3
Tertiary Flakes	1	1.7	5	7.3			3	2.9					1	0.1	8	7.3	2	3.3			3	1.7	2	3.5	25	27.8
Biface-1 Flakes			4	1.0			4	1.1							5	4.6	5	2.8	1	0.3			1	2.6	20	12.4
Biface-2 Flakes	7	0.8	5	0.5			6	0.6			1	0.2	1	0.1	12	1.1			1	0.1	1	0.1			34	3.5
Broken Flakes	8	1.0	8	0.9	3	0.3	11	3.1	2	0.3					14	2.6	3	2.7			6	1.1	2	1.1	57	13.1
Angular Fragments																			1	0.2					1	0.2
Thermal Shatter					1	0.4	2	0.9									2	1.0							5	2.3
Total by Count & Weight	16	3.5	22	9.7	4	0.7	28	10.6	2	0.3	1	0.2	2	0.2	39	15.6	15	12.4	4	1.1	10	2.9	5	7.2	148	64.4
Frequency	10.81%	5.43%	14.86%	15.06%	2.70%	1.09%	18.92%	16.46%	1.35%	0.47%	0.68%	0.31%	1.35%	0.31%	26.35%	24.22%	10.14%	19.25%	2.70%	1.71%	6.76%	4.50%	3.38%	11.18%	100.00%	100.00%
Overall Total	16	3.5	22	9.7	4	0.7	28	10.6	2	0.3	1	0.2	2	0.2	39	15.6	15	12.4	4	1.1	10	2.9	5	7.2	148	64.4
Overall Frequency	10.81%	5.43%	14.86%	15.06%	2.70%	1.09%	18.92%	16.46%	1.35%	0.47%	0.68%	0.31%	1.35%	0.31%	26.35%	24.22%	10.14%	19.25%	2.70%	1.71%	6.76%	4.50%	3.38%	11.18%	100.00%	100.00%

Key: # = Count, Wt. = Weight in Grams

Table 6. Cont'd.

Unit 8																														
Chert Type	L.1		L.2				L.3				L.4										L.5						L.6			
	Burlington		Burlington		Chouteau		Burlington		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Ste. Genevieve		Burlington		Chouteau		Kaolin		Chouteau		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																														
Blanks																					[1]	28.3							1	28.3
Debitage																														
Primary Decort. Flakes																					4	4.5							4	4.5
Tertiary Flakes					1	0.8	4	1.3			1	0.2									4	7.5	1	0.2			1	0.5	12	10.5
Biface-1 Flakes			2	0.5			2	0.3			7	5.9							1	0.1	13	6.7							25	13.5
Biface-2 Flakes			3	0.3			2	0.2			16	1.6	1	0.1	1	0.1	1	0.1			35	1.8	2	0.3	6	0.4			67	4.9
Broken Flakes	1	0.3	1	0.2			9	1.7	2	0.2	15	1.6	2	0.5			1	0.6			30	5.1			1	0.1			62	10.3
Angular Fragments											2	1.6																	2	1.6
Thermal Shatter											1	0.3									1	0.2							2	0.5
Total by Count & Weight	1	0.3	6	1.0	1	0.8	17	3.5	2	0.2	42	11.2	3	0.6	1	0.1	2	0.7	1	0.1	88	54.1	3	0.5	7	0.5	1	0.5	175	74.1
Frequency	0.57%	0.40%	3.43%	1.35%	0.57%	1.08%	9.71%	4.72%	1.14%	0.27%	24.00%	15.11%	1.71%	0.81%	0.57%	0.13%	1.14%	0.94%	0.57%	0.13%	50.29%	73.01%	1.71%	0.67%	4.00%	0.67%	0.57%	0.67%	100.00%	100.00%
Overall Total	1	0.3	6	1.0	1	0.8	17	3.5	2	0.2	42	11.2	3	0.6	1	0.1	2	0.7	1	0.1	88	54.1	3	0.5	7	0.5	1	0.5	175	74.1
Overall Frequency	0.57%	0.40%	3.43%	1.35%	0.57%	1.08%	9.71%	4.72%	1.14%	0.27%	24.00%	15.11%	1.71%	0.81%	0.57%	0.13%	1.14%	0.94%	0.57%	0.13%	50.29%	73.01%	1.71%	0.67%	4.00%	0.67%	0.57%	0.67%	100.00%	100.00%

Key: # = Count, Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 9																				
	L.1		L.2								L.3									
Chert Type	Burlington		Burlington		Chouteau		Cobden		Kaolin		Burlington		Chouteau		Cobden		Kaolin		Unidentified	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Proj. Pts./Hafted Knives			[1]	0.7																
Total by Count & Weight			1	0.7																
Frequency			100.00%	100.00%																
Stone Tool Production & Maintenance Debris																				
Debitage																				
Primary Decort. Flakes													1	6.6					1	4.0
Secondary Decort. Flakes					1	1.4														
Tertiary Flakes			6	2.7							4	1.1								
Biface-1 Flakes			7	1.4							5	1.2								
Biface-2 Flakes			6	0.4							13	1.2	1	0.1	2	0.1	1	0.1		
Broken Flakes	1	0.1	12	1.6	3	1.3	1	0.5			18	2.8	2	1.2			1	0.2		
Angular Fragments									1	1.6										
Thermal Shatter			1	1.9							3	2.9								
Total by Count & Weight	1	0.1	32	8.0	4	2.7	1	0.5	1	1.6	43	9.2	4	7.9	2	0.1	2	0.3	1	4.0
Frequency	0.44%	0.14%	14.04%	11.38%	1.75%	3.84%	0.44%	0.71%	0.44%	2.28%	18.86%	13.09%	1.75%	11.24%	0.88%	0.14%	0.88%	0.43%	0.44%	5.69%
Overall Total	1	0.1	33	8.7	4	2.7	1	0.5	1	1.6	43	9.2	4	7.9	2	0.1	2	0.3	1	4.0
Overall Frequency	0.44%	0.14%	14.41%	12.25%	1.75%	3.80%	0.44%	0.70%	0.44%	2.25%	18.78%	12.96%	1.75%	11.13%	0.87%	0.14%	0.87%	0.42%	0.44%	5.63%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Unit 9 (Cont'd.)																				
	L.4								L.5								L.6			
Chert Type	Burlington		Chouteau		Kaolin		Ste. Genevieve		Burlington		Chouteau		Cobden		Kaolin		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Proj. Pts./Hafted Knives																			1	0.7
Total by Count & Weight																			1	0.7
Frequency																			100.00%	100.00%
Stone Tool Production & Maintenance Debris																				
Debitage																				
Primary Decort. Flakes	2	0.8							1	1.3	1	0.1					1	0.3	7	13.1
Secondary Decort. Flakes															1	0.1			2	1.5
Tertiary Flakes	9	3.0							5	2.6									24	9.4
Biface-1 Flakes	9	4.5	2	1.2					6	2.3							1	0.2	30	10.8
Biface-2 Flakes	23	1.9	4	0.4					11	0.9	1	0.1	1	0.1	1	0.1	3	0.2	67	5.6
Broken Flakes	17	3.0	4	0.7	3	0.4			12	1.3	1	0.2					4	0.4	79	13.7
Angular Fragments	3	4.5																	4	6.1
Thermal Shatter	5	1.9	2	2.2			1	0.5	2	0.5	1	0.2							15	10.1
Total by Count & Weight	68	19.6	12	4.5	3	0.4	1	0.5	37	8.9	4	0.6	1	0.1	2	0.2	9	1.1	228	70.3
Frequency	29.82%	27.88%	5.26%	6.40%	1.32%	0.57%	0.44%	0.71%	16.23%	12.66%	1.75%	0.85%	0.44%	0.14%	0.88%	0.28%	3.95%	1.56%	100.00%	100.00%
Overall Total	68	19.6	12	4.5	3	0.4	1	0.5	37	8.9	4	0.6	1	0.1	2	0.2	9	1.1	229	71.0
Overall Frequency	29.69%	27.61%	5.24%	6.34%	1.31%	0.56%	0.44%	0.70%	16.16%	12.54%	1.75%	0.85%	0.44%	0.14%	0.87%	0.28%	3.93%	1.55%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 10																				
Chert Type	L.1 Burlington		L.2 Burlington		L.3 Burlington		Chouteau		Kaolin		L.4 Burlington		Chouteau		Foss. Kinkaid		Kaolin		Ste. Genevieve	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																				
Unspecified Bifaces			[1]	2.0							[1]	4.7								
Informal Flake Tools									1	12.8	1	3.2								
Total by Count & Weight			1	2.0					1	12.8	2	7.9								
Frequency			25.00%	8.81%					25.00%	56.39%	50.00%	34.80%								
Stone Tool Production & Maintenance Debris																				
Debitage																				
Primary Decort. Flakes			2	4.7	2	0.7			1	0.2	1	2.2								
Secondary Decort. Flakes							1	0.4			4	0.6	1	0.3						
Tertiary Flakes	2	0.4			8	3.9	1	0.2			8	7.8								
Biface-1 Flakes	1	0.2	2	1.1	13	6.1					18	8.6					1	1.3		
Biface-2 Flakes	2	0.1	4	0.4	18	1.7	1	0.1	3	0.3	15	1.6					2	0.1		
Broken Flakes	3	0.2	9	1.6	31	7.5	2	0.2	6	0.7	46	12.6	3	0.6			4	1.3		
Angular Fragments					1	0.3					1	1.1			1	4.5	1	0.1		
Thermal Shatter			1	0.8	5	5.1					7	4.5	1	0.4					1	0.1
Total by Count & Weight	8	0.9	18	8.6	78	25.3	5	0.9	10	1.2	100	39.0	5	1.3	1	4.5	8	2.8	1	0.1
Frequency	2.33%	0.83%	5.25%	7.96%	22.74%	23.40%	1.46%	0.83%	2.92%	1.11%	29.15%	36.08%	1.46%	1.20%	0.29%	4.16%	2.33%	2.59%	0.29%	0.09%
Overall Total	8	0.9	19	10.6	78	25.3	5	0.9	11	14.0	102	46.9	5	1.3	1	4.5	8	2.8	1	0.1
Overall Frequency	2.31%	0.69%	5.48%	8.10%	22.48%	19.34%	1.44%	0.69%	3.17%	10.70%	29.39%	35.86%	1.44%	0.99%	0.29%	3.44%	2.31%	2.14%	0.29%	0.08%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Unit 10 (Cont'd.)																
Chert Type	L.5 Burlington		Chouteau		Kaolin		L.6 Burlington		Chouteau		L.7 Burlington		Chouteau		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																
Unspecified Bifaces															2	6.7
Informal Flake Tools															2	16.0
Total by Count & Weight															4	22.7
Frequency															100.00%	100.00%
Stone Tool Production & Maintenance Debris																
Debitage																
Primary Decort. Flakes															6	7.8
Secondary Decort. Flakes															6	1.3
Tertiary Flakes	8	3.7			1	0.2	3	0.8	1	0.3	1	0.3			33	17.6
Biface-1 Flakes	10	3.5					1	0.2			2	0.5			48	21.5
Biface-2 Flakes	7	0.9	1	0.1			11	0.9			4	0.3			68	6.5
Broken Flakes	26	4.2	2	0.4	3	0.3	10	1.2	1	0.4	8	1.1	1	0.2	155	32.5
Angular Fragments	4	1.1					1	0.9							9	8.0
Thermal Shatter	3	2.0													18	12.9
Total by Count & Weight	58	15.4	3	0.5	4	0.5	26	4.0	2	0.7	15	2.2	1	0.2	343	108.1
Frequency	16.91%	14.25%	0.87%	0.46%	1.17%	0.46%	7.58%	3.70%	0.58%	0.65%	4.37%	2.04%	0.29%	0.19%	100.00%	100.00%
Overall Total	58	15.4	3	0.5	4	0.5	26	4.0	2	0.7	15	2.2	1	0.2	347	130.8
Overall Frequency	16.71%	11.77%	0.86%	0.38%	1.15%	0.38%	7.49%	3.06%	0.58%	0.54%	4.32%	1.68%	0.29%	0.15%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 6. Cont'd.

Unit 11				
	L.1 (1 m - 1.1 m B.S.)			
Chert Type	Burlington		Total	
Count & Weight	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris				
Debitage				
Broken Flakes	1	3.6	1	3.6
Total by Count & Weight	1	3.6	1	3.6
Frequency	100.00%	100.00%	100.00%	100.00%
Overall Total	1	3.6	1	3.6
Overall Frequency	100.00%	100.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 6. Cont'd.

Unit 12				
	L.2 (1 m - 1.1 m B.S.)			
Chert Type	Burlington		Total	
Count & Weight	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris				
Debitage				
Tertiary Flakes	1	0.2	1	0.2
Total by Count & Weight	1	0.2	1	0.2
Frequency	100.00%	100.00%	100.00%	100.00%
Overall Total	1	0.2	1	0.2
Overall Frequency	100.00%	100.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 7. Chert Identification by Tool and Debitage Catagories, .5 m x .5 m Test Units (Terrace), Persimmon Site.

Unit E4 - S30/W20																						
	L.1				L.2				L.3		L.4				L.5		L.6		L.7			
Chert Type	Burlington		Chouteau		Burlington		Cobden		Burlington		Burlington		Chouteau		Burlington		Burlington		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																						
Debitage																						
Secondary Decort. Flakes																	1	1.2			1	1.2
Tertiary Flakes					2	0.9			1	0.2	4	0.8							1	0.1	8	2.0
Biface-1 Flakes	1	0.3			1	0.5	1	0.2	1	0.3											4	1.3
Biface-2 Flakes	2	0.3	1	0.1	3	0.3			4	0.2	3	0.4	1	0.1	3	0.4	1	0.1			18	1.9
Broken Flakes	1	0.1							2	0.2	7	1.5	1	0.1	2	0.2	2	0.2	1	0.2	16	2.5
Angular Fragments									1	0.2	2	0.4									3	0.6
Thermal Shatter					1	0.7															1	0.7
Total by Count & Weight	4	0.7	1	0.1	7	2.4	1	0.2	9	1.1	16	3.1	2	0.2	5	0.6	4	1.5	2	0.3	51	10.2
Frequency	7.84%	6.86%	1.96%	0.98%	13.73%	23.53%	1.96%	1.96%	17.65%	10.78%	31.37%	30.39%	3.92%	1.96%	9.80%	5.88%	7.84%	14.71%	3.92%	2.94%	100.00%	100.00%
Overall Total	4	0.7	1	0.1	7	2.4	1	0.2	9	1.1	16	3.1	2	0.2	5	0.6	4	1.5	2	0.3	51	10.2
Overall Frequency	7.84%	6.86%	1.96%	0.98%	13.73%	23.53%	1.96%	1.96%	17.65%	10.78%	31.37%	30.39%	3.92%	1.96%	9.80%	5.88%	7.84%	14.71%	3.92%	2.94%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 7. Cont'd.

Unit F4 - S20/W20																								
	L.1		L.2						L.3				L.4		L.5		L.6				L.7			
Chert Type	Burlington		Burlington		Cobden		Kaolin		Burlington		Chouteau		Burlington		Burlington		Burlington		Chouteau		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																								
Debitage																								
Primary Decort. Flakes									1	0.3					1	0.2							2	0.5
Tertiary Flakes	3	0.4	1	0.4													4	1.6	1	0.1			9	2.5
Biface-1 Flakes			2	0.8									1	0.2			2	0.8					5	1.8
Biface-2 Flakes	2	0.1	1	0.1					4	0.3	1	0.1			3	0.2	5	0.6			1	0.1	17	1.5
Broken Flakes	3	0.7	1	0.2	1	0.3	1	0.3	3	0.5			3	0.4	2	0.4	6	0.9					20	3.7
Angular Fragments									1	0.9	1	1.8											2	2.7
Total by Count & Weight	8	1.2	5	1.5	1	0.3	1	0.3	9	2.0	2	1.9	4	0.6	6	0.8	17	3.9	1	0.1	1	0.1	55	12.7
Frequency	14.55%	9.45%	9.09%	11.81%	1.82%	2.36%	1.82%	2.36%	16.36%	15.75%	3.64%	14.96%	7.27%	4.72%	10.91%	6.30%	30.91%	30.71%	1.82%	0.79%	1.82%	0.79%	100.00%	100.00%
Overall Total	8	1.2	5	1.5	1	0.3	1	0.3	9	2.0	2	1.9	4	0.6	6	0.8	17	3.9	1	0.1	1	0.1	55	12.7
Overall Frequency	14.55%	9.45%	9.09%	11.81%	1.82%	2.36%	1.82%	2.36%	16.36%	15.75%	3.64%	14.96%	7.27%	4.72%	10.91%	6.30%	30.91%	30.71%	1.82%	0.79%	1.82%	0.79%	100.00%	100.00%

Key: # = Count, Wt. = Weight in Grams

Table 7. Cont'd.

Unit G4 - S10/W20																										
Chert Type	L.1 Burlington		L.2 Burlington		L.3 Burlington		Chouteau		L.4 Burlington		L.5 Burlington		Chouteau		Kaolin		L.6 Burlington		L.7 Burlington		Kaolin		L.8 Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																										
Unspecified Bifaces																	[1]	4.8							1	4.8
Total by Count & Weight																	1	4.8							1	4.8
Frequency																	100.00%	100.00%							100.00%	100.00%
Stone Tool Production & Maintenance Debris																										
Debitage																										
Primary Decort. Flakes											1	1.1													1	1.1
Secondary Decort. Flakes																			1	0.2					1	0.2
Tertiary Flakes			1	0.2	1	0.3					4	5.0													6	5.5
Biface-1 Flakes	1	0.4			1	0.3					3	1.5	1	0.9											6	3.1
Biface-2 Flakes	2	0.2	1	0.1					1	0.1	4	0.4					10	1.2	4	0.4	1	0.1			23	2.5
Broken Flakes			3	0.3	2	0.8	1	0.2	1	0.1	5	1.9			1	0.2	5	0.4	1	0.1			1	0.1	20	4.1
Angular Fragments					1	0.8					3	1.9							1	0.3					5	3.0
Total by Count & Weight	3	0.6	5	0.6	5	2.2	1	0.2	2	0.2	20	11.8	1	0.9	1	0.2	15	1.6	7	1.0	1	0.1	1	0.1	62	19.5
Frequency	4.84%	3.08%	8.06%	3.08%	8.06%	11.28%	1.61%	1.03%	3.23%	1.03%	32.26%	60.51%	1.61%	4.62%	1.61%	1.03%	24.19%	8.21%	11.29%	5.13%	1.61%	0.51%	1.61%	0.51%	100.00%	100.00%
Overall Total	3	0.6	5	0.6	5	2.2	1	0.2	2	0.2	20	11.8	1	0.9	1	0.2	16	6.4	7	1.0	1	0.1	1	0.1	63	24.3
Overall Frequency	4.76%	2.47%	7.94%	2.47%	7.94%	9.05%	1.59%	0.82%	3.17%	0.82%	31.75%	48.56%	1.59%	3.70%	1.59%	0.82%	25.40%	26.34%	11.11%	4.12%	1.59%	0.41%	1.59%	0.41%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 7. Cont'd.

Unit H4 - N0/W20																														
Chert Type	L.1 Burlington		L.2 Burlington		Chouteau		Kaolin		L.3 Burlington		Chouteau		Kaolin		L.4 Burlington		Chouteau		L.5 Burlington		Cobden		Kaolin		L.6 Burlington		L.7 Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																														
Unspecified Bifaces									[1]	8.1																			1	8.1
Total by Count & Weight									1	8.1																			1	8.1
Frequency									100.00%	100.00%																			100.00%	100.00%
Stone Tool Production & Maintenance Debris																														
Debitage																														
Primary Decort. Flakes															2	0.8													2	0.8
Tertiary Flakes											1	0.7			1	0.1													2	0.8
Biface-1 Flakes	1	0.4	1	0.4									1	0.2					2	0.8			2	0.5	2	0.8			9	3.1
Biface-2 Flakes	2	0.3	2	0.3	1	0.1									1	0.1	1	0.1	1	0.1					4	0.2	1	0.1	13	1.3
Broken Flakes	2	0.2	1	0.1			1	0.1	2	0.4					2	0.2			4	0.6	1	0.1	1	0.1	9	1.6	1	0.1	24	3.5
Angular Fragments																			2	8.4			1	0.2			2	0.7	5	9.3
Thermal Shatter															1	6.2			1	0.8									2	7.0
Total by Count & Weight	5	0.9	4	0.8	1	0.1	1	0.1	2	0.4	1	0.7	1	0.2	7	7.4	1	0.1	10	10.7	1	0.1	4	0.8	15	2.6	4	0.9	57	25.8
Frequency	8.77%	3.49%	7.02%	3.10%	1.75%	0.39%	1.75%	0.39%	3.51%	1.55%	1.75%	2.71%	1.75%	0.78%	12.28%	28.68%	1.75%	0.39%	17.54%	41.47%	1.75%	0.39%	7.02%	3.10%	26.32%	10.08%	7.02%	3.49%	100.00%	100.00%
Overall Total	5	0.9	4	0.8	1	0.1	1	0.1	3	8.5	1	0.7	1	0.2	7	7.4	1	0.1	10	10.7	1	0.1	4	0.8	15	2.6	4	0.9	58	33.9
Overall Frequency	8.62%	2.65%	6.90%	2.36%	1.72%	0.29%	1.72%	0.29%	5.17%	25.07%	1.72%	2.06%	1.72%	0.59%	12.07%	21.83%	1.72%	0.29%	17.24%	31.56%	1.72%	0.29%	6.90%	2.36%	25.86%	7.67%	6.90%	2.65%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 7. Cont'd.

Unit I4 - N10/W20																												
	L.1		L.2				L.3		L.4				L.5				L.6						L.7					
Chert Type	Burlington		Burlington		Foss. Kinkaid		Burlington		Burlington		Chouteau		Burlington		Chouteau		Burlington		Chouteau		Kaolin		Burlington		Kaolin		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools																												
Proj. Pts./Hafted Knives									[1]	0.2																	1	0.2
Formal Flake Tools					1	27.0																					1	27.0
Total by Count & Weight					1	27.0			1	0.2																	2	27.2
Frequency					50.00%	99.26%			50.00%	0.74%																	100.00%	100.00%
Stone Tool Production & Maintenance Debris																												
Debitage																												
Tertiary Flakes									2	0.2			1	0.7			3	0.6			1	0.2					7	1.7
Biface-1 Flakes							1	0.7																			1	0.7
Biface-2 Flakes			1	0.1			1	0.1	5	0.4			1	0.1	1	0.1	1	0.1					4	0.4	1	0.1	15	1.4
Broken Flakes	1	0.1	4	0.6					4	0.6	1	0.1	7	1.1			11	1.3			1	0.1	2	0.3			31	4.2
Angular Fragments									2	0.9													1	0.4			3	1.3
Thermal Shatter																			1	0.1			2	0.8			3	0.9
Total by Count & Weight	1	0.1	5	0.7			2	0.8	13	2.1	1	0.1	9	1.9	1	0.1	15	2.0	1	0.1	2	0.3	9	1.9	1	0.1	60	10.2
Frequency	1.67%	0.98%	8.33%	6.86%			3.33%	7.84%	21.67%	20.59%	1.67%	0.98%	15.00%	18.63%	1.67%	0.98%	25.00%	19.61%	1.67%	0.98%	3.33%	2.94%	15.00%	18.63%	1.67%	0.98%	100.00%	100.00%
Overall Total	1	0.1	5	0.7	1	27.0	2	0.8	14	2.3	1	0.1	9	1.9	1	0.1	15	2.0	1	0.1	2	0.3	9	1.9	1	0.1	62	37.4
Overall Frequency	1.61%	0.27%	8.06%	1.87%	1.61%	72.19%	3.23%	2.14%	22.58%	6.15%	1.61%	0.27%	14.52%	5.08%	1.61%	0.27%	24.19%	5.35%	1.61%	0.27%	3.23%	0.80%	14.52%	5.08%	1.61%	0.27%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 7. Cont'd.

Unit J4 - N20/W20																
	L.1		L.2		L.3		L.4		L.5				L.6			
Chert Type	Burlington		Burlington		Burlington		Burlington		Burlington		Kaolin		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																
Debitage																
Secondary Decort. Flakes					1	0.7									1	0.7
Tertiary Flakes					1	1.7	1	0.3	2	3.6					4	5.6
Biface-1 Flakes									1	0.2			1	0.5	2	0.7
Biface-2 Flakes							1	0.1	1	0.1			1	0.1	3	0.3
Broken Flakes	3	0.5	1	0.1	1	0.1			1	0.2	1	0.2	2	0.6	9	1.7
Angular Fragments									1	0.3			1	0.7	2	1.0
Thermal Shatter													1	0.2	1	0.2
Total by Count & Weight	3	0.5	1	0.1	3	2.5	2	0.4	6	4.4	1	0.2	6	2.1	22	10.2
Frequency	13.64%	4.90%	4.55%	0.98%	13.64%	24.51%	9.09%	3.92%	27.27%	43.14%	4.55%	1.96%	27.27%	20.59%	100.00%	100.00%
Overall Total	3	0.5	1	0.1	3	2.5	2	0.4	6	4.4	1	0.2	6	2.1	22	10.2
Overall Frequency	13.64%	4.90%	4.55%	0.98%	13.64%	24.51%	9.09%	3.92%	27.27%	43.14%	4.55%	1.96%	27.27%	20.59%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 7. Cont'd.

Unit K4 - N30/W20																														
	L.1						L.2				L.3		L.4								L.5						L.6			
Chert Type	Burlington		Chouteau		Kaolin		Burlington		Kaolin		Burlington		Burlington		Chouteau		Cobden		Kaolin		Burlington		Foss. Kinkaid		Kaolin		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris																														
Cores																														
Amorphous													1	25.0															1	25.0
Debitage																														
Secondary Decort. Flakes			1	1.2																	1	0.4							2	1.6
Tertiary Flakes	2	11.0							1	2.0							1	0.5			1	1.7	1	0.4					6	15.6
Biface-1 Flakes	1	0.6					2	0.5					1	0.5					1	0.3	1	0.2							6	2.1
Biface-2 Flakes	3	0.4									3	0.2	5	0.5							1	0.1					2	0.2	14	1.4
Broken Flakes	4	2.1	1	0.2	2	0.7	3	0.3			3	3.0	1	0.1											1	0.1	1	0.2	16	6.7
Angular Fragments	3	0.8					2	0.2			2	0.5																	7	1.5
Thermal Shatter	2	0.4									1	0.3			1	0.4											1	0.1	5	1.2
Total by Count & Weight	15	15.3	2	1.4	2	0.7	7	1.0	1	2.0	9	4.0	8	26.1	1	0.4	1	0.5	1	0.3	4	2.4	1	0.4	1	0.1	4	0.5	57	55.1
Frequency	26.32%	27.77%	3.51%	2.54%	3.51%	1.27%	12.28%	1.81%	1.75%	3.63%	15.79%	7.26%	14.04%	47.37%	1.75%	0.73%	1.75%	0.91%	1.75%	0.54%	7.02%	4.36%	1.75%	0.73%	1.75%	0.18%	7.02%	0.91%	100.00%	100.00%
Overall Total	15	15.3	2	1.4	2	0.7	7	1.0	1	2.0	9	4.0	8	26.1	1	0.4	1	0.5	1	0.3	4	2.4	1	0.4	1	0.1	4	0.5	57	55.1
Overall Frequency	26.32%	27.77%	3.51%	2.54%	3.51%	1.27%	12.28%	1.81%	1.75%	3.63%	15.79%	7.26%	14.04%	47.37%	1.75%	0.73%	1.75%	0.91%	1.75%	0.54%	7.02%	4.36%	1.75%	0.73%	1.75%	0.18%	7.02%	0.91%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 7. Cont'd.

Unit H5 - N0/W10								
	L.3		L.4		L.5			
Chert Type	Burlington		Burlington		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris								
Debitage								
Tertiary Flakes			1	0.3			1	0.3
Biface-1 Flakes					1	0.2	1	0.2
Biface-2 Flakes	1	0.1	2	0.3			3	0.4
Broken Flakes	1	0.1	4	0.4			5	0.5
Total by Count & Weight	2	0.2	7	1.0	1	0.2	10	1.4
Frequency	20.00%	14.29%	70.00%	71.43%	10.00%	14.29%	100.00%	100.00%
Overall Total	2	0.2	7	1.0	1	0.2	10	1.4
Overall Frequency	20.00%	14.29%	70.00%	71.43%	10.00%	14.29%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 7. Cont'd.

Unit I5 - N10/W10												
	L.1				L.2		L.3		L.4			
Chert Type	Burlington		Kaolin		Burlington		Burlington		Burlington		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris												
Debitage												
Primary Decort. Flakes							1	1.0			1	1
Biface-1 Flakes	1	0.2									1	0.2
Biface-2 Flakes	1	0.1			2	0.1					3	0.2
Broken Flakes	1	0.1	2	0.2	1	0.1			1	0.1	5	1.1
Total by Count & Weight	3	1.0	2	0.2	3	0.2	1	1.0	1	0.1	10	2.5
Frequency	30.00%	40.00%	20.00%	8.00%	30.00%	8.00%	10.00%	40.00%	10.00%	4.00%	100.00%	100.00%
Overall Total	3	1.0	2	0.2	3	0.2	1	1.0	1	0.1	10	2.5
Overall Frequency	30.00%	40.00%	20.00%	8.00%	30.00%	8.00%	10.00%	40.00%	10.00%	4.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 8. Chert Identification by Tool and Debitage Catagories, Mechanical Excavation Blocks, Persimmon Site.

E./W. Stripping Block				
Chert Type	Burlington		Total	
Count & Weight	#	Wt.	#	Wt.
Hunting & General Utility Tools				
Informal Flake Tools	2	16.1	2	16.1
Total by Count & Weight	2	16.1	2	16.1
Frequency	100.00%	100.00%	100.00%	100.00%
Stone Tool Production & Maintenance Debris				
Debitage				
Tertiary Flakes	2	15.9	2	15.9
Biface-1 Flakes	1	1.5	1	1.5
Thermal Shatter	4	2.5	4	2.5
Total by Count & Weight	7	19.9	7	19.9
Frequency	100.00%	100.00%	100.00%	100.00%
Overall Total	9	36.0	9	36.0
Overall Frequency	100.00%	100.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 8. Cont'd.

North Stripping Block				
Chert Type	Burlington		Total	
Count & Weight	#	Wt.	#	Wt.
Hunting & General Utility Tools				
Informal Flake Tools	1	13.0	1	13.0
Total by Count & Weight	1	13.0	1	13.0
Frequency	100.00%	100.00%	100.00%	100.00%
Stone Tool Production & Maintenance Debris				
Cores				
Amorphous	4	617.7	4	617.7
Blanks	1	42.0	1	42.0
Debitage				
Tertiary Flakes	1	8.5	1	8.5
Biface-1 Flakes	3	4.9	3	4.9
Total by Count & Weight	9	673.1	9	673.1
Frequency	100.00%	100.00%	100.00%	100.00%
Overall Total	10	686.1	10	686.1
Overall Frequency	100.00%	100.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 8. Cont'd.

South Stripping Block												
Chert Type	Burlington		Chouteau		Cobden		Ste. Genevieve		Unidentified		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools												
Proj. Pts./Hafted Knives	1	8.9									1	8.9
Unspecified Bifaces	[1]	2.6									1	2.6
Informal Flake Tools	4	46.5					1	30.8			5	77.3
Formal Flake Tools	2	35.1									2	35.1
Total by Count & Weight	8	93.1					1	30.8			9	123.9
Frequency	88.89%	75.14%					11.11%	24.86%			100.00%	100.00%
Stone Tool Production & Maintenance Debris												
Cores												
Amorphous	4	275.0									4	275.0
Blanks	[1]	22.1									1	22.1
Debitage												
Primary Decort. Flakes	1	31.2									1	31.2
Secondary Decort. Flakes	2	35.8	1	13.3							3	49.1
Tertiary Flakes	11	80.6	2	29.3							13	109.9
Biface-1 Flakes	8	17.4									8	17.4
Broken Flakes	7	14.9			1	3.4			1	1.5	9	19.8
Angular Fragments	1	6.5									1	6.5
Thermal Shatter	3	28.5									3	28.5
Total by Count & Weight	38	512.0	3	42.6	1	3.4			1	1.5	43	559.5
Frequency	88.37%	91.51%	6.98%	7.61%	2.33%	0.61%			2.33%	0.27%	100.00%	100.00%
Overall Total	46	605.1	3	42.6	1	3.4	1	30.8	1	1.5	52	683.4
Overall Frequency	88.46%	88.54%	5.77%	6.23%	1.92%	0.50%	1.92%	4.51%	1.92%	0.22%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 9. Chert Identification by Tool and Debitage Catagories, Features, Persimmon Site.

Feature 1												
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Unidentified		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools												
Proj. Pts./Hafted Knives	[1]	1.4									1	1.4
Total by Count & Weight	1	1.4									1	1.4
Frequency	100.00%	100.00%									100.00%	100.00%
Stone Tool Production & Maintenance Debris												
Debitage												
Primary Decort. Flakes	2	0.5	1	4.0							3	4.5
Tertiary Flakes	10	11.3	1	0.2							11	11.5
Biface-1 Flakes	2	1.0									2	1.0
Biface-2 Flakes	8	2.6					4	0.5	5	0.5	17	3.6
Broken Flakes	8	1.5			1	0.1					9	1.6
Angular Fragments	2	1.9									2	1.9
Total by Count & Weight	32	18.8	2	4.2	1	0.1	4	0.5	5	0.5	44	24.1
Frequency	72.73%	78.01%	4.55%	17.43%	2.27%	0.41%	9.09%	2.07%	11.36%	2.07%	100.00%	100.00%
Overall Total	33	20.2	2	4.2	1	0.1	4	0.5	5	0.5	45	25.5
Overall Frequency	73.33%	79.22%	4.44%	16.47%	2.22%	0.39%	8.89%	1.96%	11.11%	1.96%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

Table 9. Cont'd.

Feature 2				
Chert Type	Burlington		Total	
Count & Weight	#	Wt.	#	Wt.
Stone Tool Production & Maintenance Debris				
Debitage				
Angular Fragments	1	0.3	1	0.3
Total by Count & Weight	1	0.3	1	0.3
Frequency	100.00%	100.00%	100.00%	100.00%
Overall Total	1	0.3	1	0.3
Overall Frequency	100.00%	100.00%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 9. Cont'd.

Feature 3								
Chert Type	Burlington		Chouteau		Kaolin		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools								
Formal Flake Tools	1	0.2					1	0.2
Total by Count & Weight	1	0.2					1	0.2
Frequency	100.00%	100.00%					100.00%	100.00%
Stone Tool Production & Maintenance Debris								
Debitage								
Primary Decort. Flakes			1	0.2			1	0.2
Tertiary Flakes	7	11.9	1	7.9			8	19.8
Biface-1 Flakes	6	3.1					6	3.1
Biface-2 Flakes	12	1.6					12	1.6
Broken Flakes	8	1.3			2	0.8	10	2.1
Angular Fragments	4	1.8					4	1.8
Thermal Shatter	1	0.5					1	0.5
Total by Count & Weight	38	20.2	2	8.1	2	0.8	42	29.1
Frequency	90.48%	69.42%	4.76%	27.84%	4.76%	2.75%	100.00%	100.00%
Overall Total	39	20.4	2	8.1	2	0.8	43	29.3
Overall Frequency	90.70%	69.62%	4.65%	27.65%	4.65%	2.73%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams

Table 10. Chert Identification by Tool and Debitage Catagories, .5 m x .5 m Test Units (Escarpment)(Units and Levels Combined), Persimmon Site.

.5 m x .5 m Test Units														
Chert Type	Burlington		Chouteau		Cobden		Kaolin		Ste. Genevieve		Unidentified		Total	
Count & Weight	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.	#	Wt.
Hunting & General Utility Tools														
Proj. Pts./Hafted Knives	[1]	10.7											1	10.7
Informal Flake Tools	1	14.7											1	14.7
Formal Flake Tools	1	0.5											1	0.5
Total by Count & Weight	3	25.9											3	25.9
Frequency	100.00%	100.00%											100.00%	100.00%
Stone Tool Production & Maintenance Debris														
Cores														
Amorphous	2	178.4											2	178.4
Core Tools	1	46.0											1	46.0
Debitage														
Primary Decort. Flakes	6	64.1	3	8.0							2	8.5	11	80.6
Secondary Decort. Flakes	5	11.8	3	5.4									8	17.2
Tertiary Flakes	45	38.2	1	1.8			3	4.0					49	44.0
Biface-1 Flakes	17	12.3	1	0.2	5	2.5	1	0.3					24	15.3
Biface-2 Flakes	32	4.1	3	0.5	7	0.7							42	5.3
Broken Flakes	65	30.3	9	3.0	6	2.7	3	2.0	2	0.3			85	38.3
Angular Fragments	10	7.4	1	0.6									11	8.0
Thermal Shatter	7	3.4	3	1.3	1	0.3							11	5.0
Total by Count & Weight	190	396.0	24	20.8	19	6.2	7	6.3	2	0.3	2	8.5	244	438.1
Frequency	77.87%	90.39%	9.84%	4.75%	7.79%	1.42%	2.87%	1.44%	0.82%	0.07%	0.82%	1.94%	100.00%	100.00%
Overall Total	193	421.9	24	20.8	19	6.2	7	6.3	2	0.3	2	8.5	247	464.0
Overall Frequency	78.14%	90.93%	9.72%	4.48%	7.69%	1.34%	2.83%	1.36%	0.81%	0.06%	0.81%	1.83%	100.00%	100.00%

Key: # = Count; Wt. = Weight in Grams; [ ] = Fragments

APPENDIX D

CORRESPONDENCE

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-7128

217/785-4997

CALHOUN COUNTY
Swan Lake Habitat Rehabilitation
OLD LOG #920723003C-C
and Enhancement Project

PLEASE REFER TO:
IHPA LOG #940322009M-C
Persimmon Site Phase III

August 15, 1995

Ms. Suzanne Harris
US Army Corps of Engineers, St Louis Dst
PDAE Section
1222 Spruce Street
St. Louis, Missouri 63103-2833

Gentlemen:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

We have reviewed the Draft Report "Phase III Recovery at the Persimmon Site (11-C-152), Swan Lake Habitat Rehabilitation Enhancement Program (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois" and find it to be adequate. Therefore, since the adverse effect has been mitigated we concur with your determination of no adverse effect.

If you have any questions, please contact Joseph S. Phillippe, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:MEE

cc: Advisory Council on Historic Preservation
Mr. Michael J. McNerney

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

Planning Division
Environmental Planning Branch

Mr. Joseph S. Phillippe
Illinois Historic Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Mr. Phillippe:

Pursuant to the National Historic Preservation Act, Section 106 (as amended), and its implementing regulation 36CFR800, the St. Louis District, U.S. Army Corps of Engineers, hereby provides the Illinois State Historic Preservation Officer with the enclosed copy of the following draft report for review: "Phase III Data Recovery at the Persimmon Site (11-C-152), Swan Lake, Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois" by Steve Titus, Wes Neal, Jeffrey D. Anderson and Gordon Howe, American Resources Group, Ltd., Carbondale, Illinois (IHPA LOG #940322009M-C.) The archaeological mitigation through data recovery was conducted so that no adverse effect would occur to the Persimmon site's western end as the result of construction of proposed Pump Station #3.

The St. Louis District determined the Persimmon site to be eligible for listing on the National Register of Historic Places and you office concurred during a meeting held on November 14, 1994. In your letter of February 9, 1995, your office concurred with our determination of a conditional no adverse effect upon the Persimmon site due to mitigation of the portion of the site within the proposed pump station location. In your letter of March 3, 1995, your office agreed to our mitigation plan for the Persimmon site.

The multicomponent Woodland Persimmon site occupies a natural levee along the northwestern margin of a terrace overlooking the Illinois River to the north and Swan Lake to the west. The report describes the results of Phase III data recovery at the site's west. Fifty hand-dug test units, totaling 31.5 square meters of surface area, were excavated across the proposed impact zone and an area of about 1,205 square meters was mechanically stripped and all subsurface features (n=3) were excavated. The geomorphological study conducted concurrent with the archaeological investigation used sampling tube cores and backhoe

trenches to examine the deposits within the area. This portion of the site was most intensively occupied by Early Woodland Black Sand groups, with lesser Middle Woodland and Late Woodland occupations. The site consists of numerous reoccupations, each of short duration. The investigations, particularly the ceramic study, produced important information about cultural change at the southern end of the Illinois Valley during the Woodland period.

Based on the data recovery investigations described in the draft report, the St. Louis District has mitigated for the adverse effect and therefore, there will be no adverse effect to the Persimmon archaeological site from construction of the Swan Lake Pump Station #3. The St. Louis District requests the concurrence of the Illinois State Historic Preservation Officer in this determination.

If you have any questions, please contact Ms. Suzanne E. Harris of my staff at (314) 331-8467.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosure

Illinois Historic Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

PLEASE REFER TO:
IHPA LOG #940322009M-C

CALHOUN COUNTY
Swan Lake Habitat Rehabilitation
OLD LOG #920723003C-C
and Enhancement Project

March 3, 1995

Ms. Suzanne Harris
US Army Corps of Engineers, St Louis Dst
PDAE Section
1222 Spruce Street
St. Louis, Missouri 63103-2833

Gentlemen:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

We have reviewed the mitigation plan for Phase III work at the Persimmon Site 11-C-152and find it to be adequate.

If you have any questions, please contact Joseph S. Phillippe, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:MEE

cc: Advisory Council on Historic Preservation

PD-A READING FILE

23 FEB 1995

Planning Division
Environmental Planning Branch

Ms. Anne E. Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

We have received your letter of February 9, 1995 concurring with the results of our Phase I survey and our determination of a conditional no adverse effect upon significant historic properties as a result of the Swan Lake Habitat Rehabilitation and Enhancement Project, Calhoun County, Illinois (IHPA LOG# 940322009M-C). In accordance with 36 CFR Part 800.9 (C)(1), there will be no adverse effect upon significant historic properties because of the following mitigation measures: 1) mitigation of site 11-C-152 (Persimmon Site), 2) avoidance of site 11-C-212, and 3) monitoring construction excavation of buried soil surfaces at the pump station #2 eastern channel. No human remains have been found in the project area.

Enclosed, for your review and concurrence is our mitigation plan (scope of work) for Phase III investigations at site 11-C-152 (Persimmon Site). The scope was discussed and revised in telephone conversations between Mr. Joseph S. Phillippe of your staff and Ms. Suzanne E. Harris of my staff on February 3 and 6, 1995. A copy of this letter, along with all relevant project documentation and Phase I report is being forwarded to the Advisory Council on Historic Preservation for their concurrence. If you have any questions, please contact Ms. Harris at (314) 331-8580.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosure

Planning Division
Environmental Planning Branch

Ms. Valerie DeCarlo
Advisory Council on Historic
Preservation
1100 Pennsylvania Avenue NW
Room 809
Washington, DC 20004

Dear Ms. DeCarlo:

Pursuant to the National Historic Preservation Act, Section 106 (as amended), and its implementing regulation 36CFR800, the St. Louis District, U.S. Army Corps of Engineers hereby requests that the Advisory Council on Historic Preservation concur with our determination of no adverse effect to the prehistoric Persimmon archaeological site (11-C-152) as a result of construction of the Swan Lake Habitat Rehabilitation and Enhancement Project (HREP), Environmental Management program (EMP), located in Pool 26, Illinois River, Calhoun County, Illinois. In accordance with 36CFR Part 800.9(c), the St. Louis District has determined that no adverse effect will occur to the Persimmon site due to the mitigation plan which is being developed in consultation with the Illinois State Historic Preservation Officer (SHPO).

The Swan Lake project involves constructing a riverside levee, an interior levee, three pumping stations with water control structures and lake dredging. The purpose is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in the three lake units. A portion of the Persimmon site lies within the construction area of the proposed Pump Station #3 at the Swan Lake project's downstream end. Project engineers have determined that Pump Station #3 is essential to the Swan HREP and the topography is not suitable for relocating the pump station elsewhere.

Initial ground preparation at Pump Station #3 is scheduled to begin in June, 1995. The Swan Lake project is located on Corps of Engineers property which is managed by the Illinois Department of Conservation and the U.S. Fish and Wildlife Service. Because the project is located within a state wildlife management area and a national wildlife refuge, the Corps must follow a construction schedule which enables us to comply with requirements of the Fish and Wildlife Coordination Act of 1958, as amended, the Endangered Species Act of 1973, as amended an the

Clean Water Act of 1973, Section 404, as amended. Requirements of these law prohibit construction during much of the usual construction season.

The St. Louis District determined the Persimmon site to be eligible for listing on the National Register of Historic Places under criterion d), the potential to yield information important in prehistory (36CFR Sec. 60.6), due to it potential to provide important information on the Early Woodland and Late Woodland occupations there. The Illinois SHPO concurred with this determination in a meeting held on November 14, 1994. Enclosed is a copy of the draft Phase I report, which described the Persimmon site (pp. 55-69) and the characteristics which make the site eligible. The report is entitled "A Phase I Archaeological Survey for Historic Properties within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois," by Steve Titus, W. Gordon Howe, Wes Neal, and Jeffrey D. Anderson, American Resources Group, Carbondale Illinois, 1994. No human remains have been found at the Persimmon site or elsewhere in the project area.

In their letter of February 9, 1995, the Illinois SHPO also concurred with the results of our Phase I survey based on the draft report an our determination of a conditional no adverse effect upon the Persimmon site due to mitigation of the portion of the site within the proposed Pump Station #3 location. The mitigation plan (scope of work) has been discussed and revised in telephone conversations between Mr. Joseph S. Phillippe of the Illinois SHPO and Ms. Suzanne E. Harris of my staff on February 3 and 6, 1995. We are sending a copy of the mitigation plan to the Illinois SHPO and to you for review and concurrence. We are also enclosing all relevant project correspondence. If you have any questions, please contact Ms. Harris at (314) 331-8467.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosures

SEH 2/23/95
HARRIS
PD-A
SEH 2/22/95
for RAGLAND
PD-A
4/23/95
KELLETT
PM-M
HAWICKHORST
PD
DUTT
PD

PD-A READING FILE

MAR 3 1 1995

Planning Division
Environmental Planning Branch

Chief Don Giles
Peoria Tribe of Oklahoma
P.O. Box 1527
Miami, Oklahoma 74355

Dear Chief Giles:

The U.S. Army Corps of Engineers, St. Louis District is gathering information for possible notification and consultation under the Native American Grave Protection and Repatriation Act of 1990 and the National Historic Preservation Act of 1966, as amended, in connection with the Swan Lake Habitat Rehabilitation and Enhancement Project (HREP), Calhoun County, Illinois. The St. Louis District is planning construction at Swan Lake, located on the lower Illinois River near its confluence with the Mississippi River, in an area which historic sources indicate was occupied by Native American tribes later called the Illinois Confederacy. One such tribe was the Tamaroa.

As background to the project, the Swan Lake HREP will be located on Corps property managed as the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge, U.S. Fish and Wildlife Service and the Fuller Lake State Fish and Waterfowl Management Area, Illinois Department of Conservation. Swan Lake is located in Navigation Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right [west] bank). The project is part of the Environmental Management Program established by P.L. 99-662 to enhance and rehabilitate the Upper Mississippi River system. The project purpose is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in three lake units. The project involves constructing a riverside levee, an interior levee, three pumping stations with water control structures and selective dredging of recent (twentieth century) lake sediments.

The St. Louis District conducted a Phase I archaeological survey of construction corridors of the Swan Lake HREP in October, 1994. The survey located two prehistoric sites with occupations dating before A.D. 1000. One of the sites also has an historic occupation dating around 1900.

The St. Louis District wishes to confirm whether or not the Peoria Tribe of Oklahoma is the legal representative of the Tamaroa, who no longer exist as a political entity. If the Peoria Tribe is the legal representative, the St. Louis District wishes to know what your interest in the project may be and to whom all future comments should be addressed. We would also like to know if you have a prepared policy statement (such as that of the Caddo of Oklahoma) concerning how you would wish human remains to be treated, in the unlikely event we should encounter Native American remains apparently dating to the late seventeenth or early eighteenth centuries.

If you have any questions or need further information, please contact Ms. Harris of my staff at (314) 331-8467.

Sincerely,

Signed
THOMAS C. SUERMANN
Colonel, EN
Commanding

Thomas C. Suermann
Colonel, U.S. Army
District Engineer